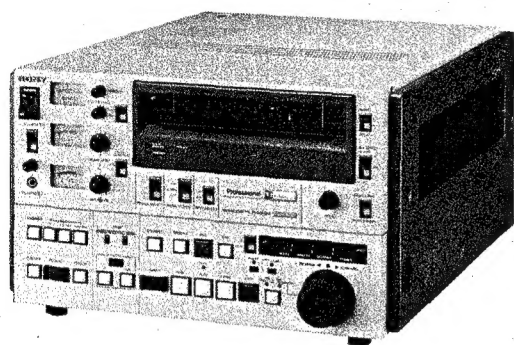


**SONY**<sup>®</sup>

VIDEOCASSETTE RECORDER

**BVU-820P**

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Professional **U-maticH**

OPERATION AND MAINTENANCE MANUAL

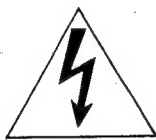
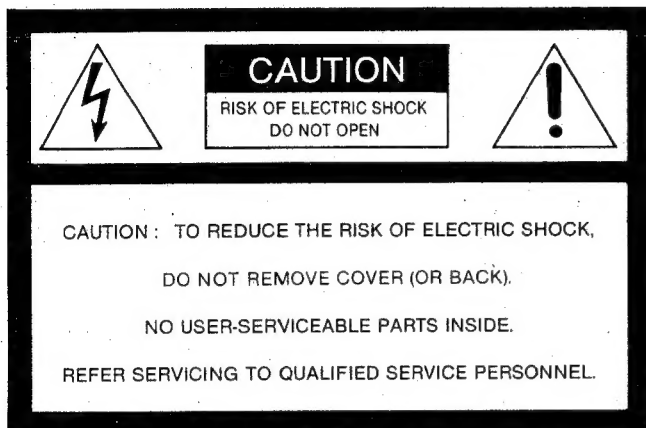
2nd Edition (Revised 14)

Serial No. 10301 and Higher



## WARNING

To prevent fire or shock hazard, do not expose the set to rain or moisture.



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**Warning**—This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

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# TABLE OF CONTENTS INHALTSVERZEICHNIS

## 1. OPERATION

1-1. Features	1-1
1-2. Cassette Insertion and Removal	1-2
1-3. Location and Function of Controls	1-4
1-4. Recording	1-13
1-5. Playback	1-17
1-6. Editing	1-23
1-6-1. Editing with Two BVU-820P Videocassette	
Recorders	1-23
Blink of the Lamps	1-35
How to use the Search Button	1-35
Quick Editing	1-36
Continuous Editing	1-37
Split Edit	1-38
Live Edit	1-40
Manual Editing	1-41
1-6-2. Editing Using One BVU-820P Videocassette	
Recorder	1-42
1-6-3. Editing with a Conventional Control Unit	1-43
1-6-4. Time Code Editing	1-44
1-7. Tape Protection	1-46
1-8. Cleaning the Head	1-46
1-9. Check Routines	1-47
1-10. Connections	1-54
1-11. Specifications	1-59
1-12. Repacking for shipment	1-124

## 1. BETRIEB

1-1. Besondere Merkmale	1-61
1-2. Einlegen und Herausnehmen einer Cassette	1-63
1-3. Lage und Funktion der Bedienungselemente	1-65
1-4. Aufnahme	1-74
1-5. Wiedergabe	1-79
1-6. Schneiden	1-85
1-6-1. Schneiden unter Verwendung von zwei BVU-820P	
Video-Cassettenrecorder	1-85
Blinken der Lampen	1-97
Verwendung des Suchlauf-Knopfes	1-97
Schnelles Schneiden	1-98
Fortlaufendes Schneiden	1-99
Split -Schnitt	1-100
Live -Schnitt	1-102
Manuelles Schneiden	1-103
1-6-2. Schneiden unter Verwendung eines BVU-820P	
Video-Cassettenrecorder	1-104
1-6-3. Schneiden unter Verwendung einer herkömmlichen	
Steuereinheit	1-105
1-6-4. Zeitcode-Schnittbetrieb	1-106
1-7. Bandschutzautomatik	1-108
1-8. Reinigung der Köpfe	1-108
1-9. Funktionsüberprüfungen	1-109
1-10. Anschlüsse	1-117
1-11. Technische Daten	1-122
1-12. Wiederverpackung für Transportzwecke	1-124

## 2. INSTALLATION

2-1. Operation Environment	2-1
2-2. Installation Space	2-1
2-3. Operating Voltage	2-2
2-4. Connections	2-3
2-5. Input/Output Signal of the Connector	2-7
2-6. Connection Connector	2-8
2-7. Select Switch Setting	2-8
2-8. Rack Mounting	2-9
2-9. Control Panel Unit Removal	2-11
2-10. Supplied Accessory	2-11
2-11. Optional Accessory	2-11

## 3. TECHNICAL INFORMATION

3-1. Specifications	3-1
3-2. Location of Main Parts	3-2
3-2-1. Location of the Printed Circuit Board	3-2
3-2-2. Location of the Mechanical Main	
Parts/Components	3-5
3-3. Printed Circuit Boards	3-7
3-4. Mechanical Operation	3-7
3-4-1. Cassette-in/Cassette-out Operation	3-7
3-4-2. Threading and Unthreading Operation	3-9
3-4-3. Electrical Tape Tension Detector	3-11
3-4-4. FWD, REV, SHUTTLE, JOG Operation	3-12
3-4-5. F. FWD and REW Operation	3-14
3-5. Cassette Removal Procedure when Normal Ejection	
is not Possible	3-15

## 4. PERIODIC CHECK AND MAINTENANCE

4-1. Periodic Check and Maintenance Schedule	4-1
4-2. System Control Operation Check	4-3
4-2-1. Playback, F. FWD, REW, SHUTTLE, JOG	
and Preroll Function Check	4-3
4-2-2. Record Function Check	4-5
4-2-3. Editing Function Check	4-6
4-2-4. Dynamic Tracking Function Check	4-8
4-3. Maintenance after Repairs	4-10
4-4. Fixture for Periodic Check and Maintenance	4-10
4-5. Periodic Check and Maintenance Procedure	4-10
4-5-1. Cleaning Procedure of the Video Heads	
and the Rotary Erase Heads	4-13
4-5-2. Cleaning Procedure of Tape Movement Areas	4-13
4-5-3. Head Degaussing	4-13
4-5-4. Cleaning of Slip-Rings and Brushes	4-13

## 5. SERVICE INFORMATION

5-1. Removal of Cabinet	5-1
5-2. Removal of Cassette-up Compartment	5-2
5-3. Spare Parts	5-2
5-4. Module Extender	5-2
5-5. Caution of High Voltage	5-2
5-6. Muting of Tape Beginning Sensor and	
Tape End Sensor	5-3
5-7. Fixture	5-3



## 6. REPLACEMENT OF MAJOR PARTS

6-1. Replacement of Drum Assembly	6-1
6-2. Replacement of Upper Drum Assembly	6-1
6-3. Replacement of Tension Detector	6-3
6-4. Replacement of Motor	6-4
6-4-1. Replacement of Reel Motor	6-4
6-4-2. Replacement of Capstan Motor	6-4
6-4-3. Replacement of Threading Motor	6-5
6-4-4. Replacement of Cassette-up Assembly's Motor	6-5
6-5. Replacement of the Stationary Head	6-6
6-5-1. Replacement of Erase Head	6-6
6-5-2. Replacement of Time Code Head	6-6
6-5-3. Replacement of Audio/CTL Head	6-6
6-6. Replacement of Pinch Roller	6-7
6-7. Replacement of Brake Band	6-7
6-8. Replacement of the Belt	6-8
6-8-1. Replacement of the Threading Motor's Belt	6-8
6-9. Brush Replacement	6-9
6-10. Adjustment Item Table after Main Parts Replacement	6-10

## 7. LINK AND DRIVE SYSTEM ALIGNMENT

7-1. Cassette Retainer Height Adjustment	7-4
7-2. Reel Table Height Adjustment	7-4
7-3. EM-1 Board Mounting Position Adjustment	7-5
7-4. Reel Motor Shaft Slantness Adjustment	7-6
7-5. S Tension Regulator Arm FF Position Adjustment	7-7
7-6. Supply Tension Regulator Arm FWD Position Adjustment	7-8
7-7. Cassette-up Compartment Adjustment	7-9
7-7-1. IN Switch Position Adjustment	7-9
7-7-2. DOWN Switch Position Adjustment	7-10
7-8. Skew Solenoid Mounting Position Adjustment	7-11
7-9. Supply Tension Solenoid Mounting Position Adjustment	7-11
7-10. Threading System Adjustment	7-12
7-10-1. Threading Ring Rotation Adjustment	7-12
7-10-2. Ring Drive Gear Engagement Adjustment	7-13
7-10-3. Ring Sensor Position Adjustment	7-13
7-10-4. M Stopper Mounting Position Adjustment	7-14
7-10-5. TH Holder End Position Adjustment	7-14
7-10-6. Threading Slider EJECT Position Adjustment	7-15
7-10-7. Release Cam Installing Position Adjustment	7-16
7-10-8. Photo Coupler Cover Height Adjustment	7-16
7-10-9. 5th Guide Operating Position Adjustment	7-16
7-10-10. 5th Guide Unthreading Position Adjustment	7-18
7-10-11. T End Sensor Position Adjustment	7-19
7-10-12. Take-up Tension Arm, Unthreading Position Adjustment	7-20

## 8. BACK TENSION AND TORQUE ALIGNMENT

8-1. Brake Solenoid Mounting Position Adjustment	8-1
8-2. Brake Lever Adjustment	8-1
8-3. Brake Torque Adjustment	8-2
8-4. FWD Back Tension Adjustment	8-3
8-5. Tension Detector Adjustment	8-4
8-5-1. Tension Detector Stopper Position Adjustment	8-4
8-5-2. T Tension Detector Roller Zenith Adjustment	8-5
8-5-3. S Tension Detector Roller Zenith Adjustment	8-6
8-6. Operation Check and Adjustment of Tension Detector	8-8
8-6-1. Supply Tension Detector 0 Gram Point Adjustment	8-8
8-6-2. Take-up Tension Detector 0 Gram Point Adjustment	8-9
8-6-3. Supply Tension Detector 100 Gram Point Adjustment	8-10
8-6-4. Take-up Tension Detector 100 Gram Point Adjustment	8-11
8-7. Take-up Reel Motor Current Sensitive Adjustment	8-12
8-8. Supply Reel Motor Current Sensitive Adjustment	8-13
8-9. DME FG Output Check	8-14

## 9. TAPE RUN ALIGNMENT

9-1. Pinch Roller Adjustment	9-1
9-1-1. Pinch Lever Right Angle Adjustment	9-1
9-1-2. Pinch Roller Stopper Position Adjustment	9-2
9-1-3. Pinch Roller Self-Alignment Adjustment	9-3
9-1-4. Pinch Roller Zenith Adjustment	9-4
9-1-5. Pinch Roller Azimuth Adjustment	9-4
9-1-6. Pinch Roller Preset Adjustment	9-6
9-2. FWD/REV Tape Run Adjustment	9-7
9-2-1. Tape Run Adjustment at Threading Guide (1)	9-7
9-2-2. Tape Wrinkle Release Adjustment at Pinch Roller	9-8
9-2-3. Tape Run Adjustment at Correction Guide (A)	9-9
9-2-4. Tape Run Adjustment at 6th Guide	9-10
9-2-5. Tape Run Adjustment at S Guide (1) and (2)	9-11
9-2-6. FWD/REV Tape Run Overall Adjustment	9-12
9-2-7. S Tension Regulator Arm Pin Slantness Adjustment	9-14
9-3. Video Tracking Adjustment	9-16
9-4. Erase Head Zenith Adjustment	9-18
9-5. Time Code Head Adjustment	9-19
9-5-1. Time Code Head Tape-to-Head Contact Adjustment	9-19
9-5-2. Time Code Head Height Adjustment	9-20
9-5-3. Time Code Head Zenith Adjustment	9-21
9-6. Audio Head Adjustment	9-22
9-6-1. Audio Head Height Adjustment	9-22
9-6-2. Audio Head Zenith Adjustment	9-23
9-6-3. Audio Head Azimuth Adjustment	9-24
9-6-4. Audio Head Phase Adjustment	9-24
9-7. Audio/CTL Head Position Adjustment	9-25
9-8. Video Head Dihedral Adjustment	9-25
9-9. Video Head Azimuth Adjustment	9-27
9-10. Slip-Ring and Brush Position Adjustment	9-28



## 10. POWER SUPPLY/SYSTEM CONTROL ALIGNMENT

10-1. Switching Regulator Adjustment	10-1
10-2. REG 5V Adjustment	10-1
10-3. REG 12V Adjustment	10-1
10-4. Tape Beginning/End Detector Adjustment	10-1
10-5. Search x10 Mode Detector Adjustment	10-1
10-6. Pinch Roller Pressing Timing Adjustment (1)	10-2
10-7. Pinch Roller Pressing Timing Adjustment (2)	10-2

## 11. SERVO SYSTEM ALIGNMENT

11-1. Capstan FG Bias Adjustment	11-1
11-2. Drum Free Speed Adjustment	11-1
11-3. Capstan Free Speed Adjustment	11-1
11-4. Search x5 Adjustment	11-1
11-5. Search x1/30 Adjustment	11-1
11-6. Search x1 Adjustment (RV3 fine adj.)	11-2
11-7. Tracking Control Calibration	11-2
11-8. Drum AFC (H period) Adjustment	11-2
11-9. AFC Bias Adjustment	11-2
11-10. Capstan Speed Detector Adjustment	11-2
11-11. Switching Position Adjustment	11-2
11-12. Drum Lock Phase Adjustment (RV4 fine adj.)	11-3
11-13. Picture Splitting Compensator Adjustment	11-3
11-14. Take-up Reel Motor Speed Adjustment	11-3
11-15. Supply Reel Motor Speed Adjustment	11-3
11-16. Capstan Synchronize Adjustment	11-4
11-17. REF 135 degrees Burst Pulse Adjustment	11-4
11-18. PB 135 degrees Burst Pulse Adjustment	11-4
11-19. Dynamic Tracking Control System Adjustment	11-5
11-19-1. Drum Rotation Detector Adjustment	11-5
11-19-2. Preparation for DT Adjustment	11-5
11-19-3. DT Slope Offset Preadjustment	11-6
11-19-4. DT Operating Point Preadjustment (NORMAL)	11-6
11-19-5. DT Operating Point Preadjustment (FWDx2)	11-6
11-19-6. Hysteresis Cancel Level Adjustment	11-6
11-19-7. DT Gain Preadjustment	11-7
11-19-8. DT Operating Point (RV10, 12 fine adj.)	11-7
11-19-9. DT Gain Adjustment (RV15, 16 fine adj.)	11-7
11-19-10. DT Slope Level Adjustment	11-7
11-19-11. Wobbling Gain/DT Slope Offset Adjustment	11-8
11-19-12. Automatic Tracking Gain Adjustment	11-8
11-19-13. DT Self-record/Playback Adjustment	11-9
11-20. DT Switching Position Adjustment (1)	11-10
11-21. DT Switching Position Adjustment (2)	11-10
11-22. DT x2, x3 Mode Switching Position Adjustment	11-11
11-23. FH Phase Adjustment	11-11
11-24. Assemble Compensator Adjustment	11-11

## 12. AUDIO SYSTEM ALIGNMENT

12-1. Audio Level Control Setting	12-1
12-2. Output Level Adjustment	12-1
12-3. Monitor Out Level Adjustment	12-1
12-4. Level Meter Calibration	12-1
12-5. Limiter Level Adjustment	12-2
12-6. Playback Frequency Response/Level Adjustment	12-2
12-7. Playback Output Level Adjustment	12-2
12-8. Bias Oscillator Frequency Adjustment	12-2
12-9. Audio Erase Current Adjustment (1)	12-2
12-10. Audio Erase Current Adjustment (2)	12-2
12-11. Audio Erase Current Adjustment (3)	12-2
12-12. Record Bias Current Adjustment (1)	12-3
12-13. Bias Trap Adjustment (1)	12-3
12-14. Bias Trap Adjustment (2)	12-3
12-15. Bias Trap Adjustment (3)	12-3
12-16. Record Bias Current Adjustment (2)	12-3
12-17. Record Current Level Adjustment	12-3
12-18. Record Current Frequency Response Adjustment (1)	12-4
12-19. Record Current Frequency Response Adjustment (2)	12-4
12-20. Crosstalk Cancel Adjustment (1)	12-4
12-21. Crosstalk Cancel Adjustment (2)	12-4
12-22. CH-1 INSERT OFF Delay Time Adjustment	12-4
12-23. CH-2 INSERT OFF Delay Time Adjustment	12-5
12-24. CH-1 BIAS ON Delay Time Adjustment	12-5
12-25. CH-2 BIAS ON Delay Time Adjustment	12-6
12-26. CH-1 REC OFF Delay Time Adjustment	12-6
12-27. CH-1 REC/EE OFF Delay Time Adjustment	12-6
12-28. CH-2 REC OFF Delay Time Adjustment	12-7
12-29. CH-2 REC/EE OFF Delay Time Adjustment	12-7

## 13. VIDEO SYSTEM ALIGNMENT

13-1. Playback Amplifier Adjustment	13-2
13-1-1. DC Balance Adjustment	13-2
13-1-2. RF 7MHz Adjustment	13-2
13-1-3. RF 5.4MHz Tuning	13-2
13-1-4. RF Frequency Response Adjustment	13-2
13-1-5. Y-RF Balance/Level Adjustment	13-3
13-1-6. Chroma RF Balance/Level Adjustment	13-3
13-1-7. Audio Bias Trap Adjustment	13-3
13-2. Y Demodulator Adjustment	13-4
13-2-1. Dropout Compensator Sensitivity Adjustment	13-4
13-2-2. Carrier Balance Adjustment	13-4
13-2-3. V BLK Pulse Width Adjustment	13-4
13-2-4. H BLK Pulse Width Adjustment	13-4
13-2-5. B/W Mode Y Output Level Adjustment	13-5
13-2-6. Color Mode Y Output Level Adjustment	13-5
13-2-7. Dropout Compensator Level Adjustment	13-5
13-3. Chroma Demodulator Adjustment	13-5
13-3-1. REF OSC Adjustment	13-5
13-3-2. DT Blanking Pulse Adjustment	13-6
13-3-3. ACC Burst Flag Adjustment	13-6
13-3-4. APC Burst Flag Adjustment	13-6
13-3-5. VCO Frequency Adjustment	13-6
13-3-6. PB 5.36MHz Tuning Adjustment	13-7
13-3-7. ACC Level Adjustment	13-7
13-3-8. Converter Balance Adjustment	13-7
13-3-9. DUB Chroma Level Adjustment	13-7
13-3-10. High Speed ACC Level Adjustment	13-8
13-3-11. Pilot Burst Gate Pulse Adjustment	13-8
13-3-12. Pilot Burst Eliminator DC Level Adjustment	13-8
13-3-13. PB 135 degrees Burst Tuning	13-8
13-3-14. Y/C Mix Level Adjustment	13-8
13-3-15. Noise Canceller Adjustment	13-9



13-3-16. Noise Canceller Low-range Compensator Adjustment	13-9
13-3-17. Time Code Detector Level Adjustment	13-9
13-3-18. DG Compensator Adjustment	13-9
13-3-19. TBC VCO Shift Adjustment	13-9
13-4. Modulator Adjustment	13-10
13-4-1. Sync Tip Carrier Adjustment	13-10
13-4-2. FM Deviation Adjustment	13-10
13-4-3. Modulator Balance Adjustment	13-10
13-4-4. White Clip Adjustment	13-10
13-4-5. SC Trap Adjustment	13-10
13-4-6. Modulator Frequency Response Adjustment	13-11
13-4-7. Video Meter Adjustment	13-11
13-4-8. 5.36MHz Oscillator Adjustment	13-11
13-4-9. APC fo Adjustment	13-11
13-4-10. Pilot Burst Width Adjustment	13-11
13-4-11. Pilot Burst Level/REC Chroma Level Adjustment	13-11
13-4-12. Pilot Burst Phase Adjustment	13-12
13-4-13. REF 135 degrees Burst Pulse Level Adjustment	13-12
13-4-14. REC ACC Level Adjustment	13-12
13-4-15. REC Chroma Frequency Response Adjustment	13-12
13-5. Record Amplifier Adjustment	13-13
13-5-1. Record Current Frequency Response Adjustment	13-13
13-5-2. Y Record Current Adjustment	13-13
13-5-3. Chroma Record Current Adjustment	13-14
13-5-4. Y RF level Adjustment	13-14
13-5-5. Tracking Meter Calibration	13-14
13-6. Y/C Delay Time Adjustment	13-14
13-6-1. PB Delay Time Adjustment	13-14
13-6-2. DUB Delay Time Adjustment	13-15
13-6-3. Record Delay Time Adjustment	13-15
13-7. Overall Frequency Response Adjustment	13-16
13-7-1. B/W Mode Y Playback Frequency Response Adjustment	13-16
13-7-2. Color Mode Y Phase Equalizer Adjustment	13-16
13-7-3. Smear Compensator Adjustment	13-16

#### 14. EDITING SYSTEM ALIGNMENT

14-1. Rotary Erase Current Adjustment	14-1
14-2. CONF1 Mode Switching Pulse Adjustment	14-1
14-3. RE Gate Pulse Position Adjustment	14-1
14-4. Time Code Playback Amplifier Adjustment	14-2
14-5. Time Code Record Current Adjustment	14-2

#### 15. BLOCK DIAGRAM

15-1. Tape Format	15-1
15-1-1. Heads Location	15-1
15-1-2. Tape Pattern	15-1
15-2. Frequency Allocation	15-2
OVERALL SYSTEM	15-3
Y/C MODULATOR	15-5
Y/C REC PB/ROTARY ERASE AMPLIFIER	15-7
Y DEMODULATOR	15-9
CHROMA DEMODULATOR	15-11
AUDIO SYSTEM	15-14
DRUM/CAPSTAN SERVO	15-17
REEL/TAPE TENSION SERVO	15-21
SWITCHING PULSE DELAY SYSTEM	15-25

#### 16. SEMICONDUCTOR ELECTRODES

IC	16-1
TR, FET, LED	16-17

#### 17. PRINTED CIRCUIT BOARD AND SCHEMATIC DIAGRAM

17-1. Circuit Function of the Printed Circuit Board	17-1
17-2. Location of the Printed Circuit Board	17-2

##### VIDEO

MD-18	17-5
RP-10-1	
DA-6	17-11
YD-14	17-17
CD-20	17-23

##### AUDIO

AO-3	
AO-2	17-29
HP-5	
SA-9	17-33
AU-13	
AU-25	17-38

##### SERVO

SV-52-1	17-45
CF-9	17-51
RS-3-1	17-57
RS-4	17-65

##### DYNAMIC TRACKING

DT-3-1	17-73
--------	-------

##### POWER SUPPLY/POWER DRIVE

PD-19	
PD-15	
PD-17	
PD-21	17-79
DR-9	
DR-19	
BP-6	
PW-50	
RL-14	
PW-79	17-83
FU-16	

##### SYSTEM CONTROL

RE-3	
PC-8	17-87
PC-12	
SY-92 (S/N 10001 ~ 10040)	17-91(a)
SY-36-1 (S/N 10041 ~)	17-91(b)
SY-37-1/37A	17-97
SY-71	17-104
KY-9	
KY-14	
DP-9	17-111
PC-9	
PC-14	

##### TIME CODE

TC-13-1	17-117
---------	--------



## FRAME

FRONT CHASSIS BLOCK	
CC-9	
CC-10	
CC-11	
LV-1	17-122
MF-1	
MS-5	
PR-33	
WL-1	
SYSTEM CONTROL BLOCK	
(MB-9)	
EK-2	
EK-3	
EM-1	
LE-4	
PC-7	17-128
PH-1	
RM-4	
TC-12	
TM-4	
TM-8	
MB-36-1 BLOCK	17-133
REAR CHASSIS BLOCK	17-137
FC-10	17-141

## 18. SPARE PARTS AND FIXTURE

18-1. Parts Information	18-1
18-2. Exploded View	18-1
Reel Chassis (1)	18-5
Supply Tension Detector Block	18-7
Take-up Tension Detector Block	18-8
Threading Block	18-9
Threading Arm Block	18-11
Pinch Lever Block	18-13
Reel Chassis (bottom view)	18-14
Drum Block	18-15
Cassette-up Compartment Block	18-17
Control Panel Block	18-19
Function Control Panel Block	18-21
Power Chassis Block	18-23
Connector Panel Block (1)	18-25
Connector Panel Block (2)	18-27
Chassis Block	18-28
Ornamental Panel Block (1)	18-29
Ornamental Panel Block (2)	18-31
Printed Circuit Board	18-32
Supplied Accessory	18-33
18-3. Electrical Parts List	18-35
18-3-1. Notes for Electrical Parts List	18-35
Parts Arranged in their Printed Circuit Board's	
Alphanumeric Order	18-43
Frame	18-69
18-4. Packing Material and Accessory (Supplied)	18-73







## SECTION 1 OPERATION

### 1-1. FEATURES

#### Quick access to the edit points

Search functions providing a recognizable picture in the shuttle mode (in which the playback speed can be varied from 1/30 to 10 times normal speed in both forward and reverse) and the jog mode (in which the picture moves as the search dial moves), enable operators to locate the edit point more quickly. Also in the fast forward and rewind mode, the tape is threaded around the drum and a recognizable picture can be obtained using a time base corrector.

#### Edit functions

In the assembly edit mode, the video, audio channel 1 and channel 2 signals can be edited simultaneously. In the insert edit mode, the video, audio channel 1 and channel 2 signals can be edited independently. The edit material can be viewed before and after recording.

#### Front access

Every operation, including cassette insertion and removal, is performed from the front panel, which can be tilted to individual's preference up to 90° (6 steps).

#### Remote control

When editing using two BVU-820P videocassette recorders, the front panel controls of the recorder, which can be detached, can also remotely control the player.

#### Time code recording/playback function

The tape has a special channel, the address track, which allows the EBU time code to be recorded and played back without sacrificing an audio channel with a time code generator and reader.

#### $\phi^2$ (Phi square)-servo loop circuit

The BVU-820P feature prevents picture disturbances ("flagging" or "whipping") at the edit point, since it ensures proper H-phase and frame phase alignment. The H-phase alignment is performed automatically.

#### Capstan servo

The BVU-820P incorporates a capstan servo circuit which locks onto the external signal.

#### Framing servo

This identifies each even and odd field in a given frame, and ensures that edits occur precisely between the end of an even field and the start of the next odd field, for clean edits.

#### Color framing

The BVU-820P incorporates a color framing circuit which identifies each of the four fields in a frame and aligns the fields to prevent the color flashing at the edit point.

#### Direct drive system with six DC motors

Six motors are mounted independently in the BVU-820P. Brushless DC motor, directly coupled with the drum assembly and newly developed brushless DC motor, is employed to the capstan assembly. Since the supply reel and the take-up reel are driven by the independent motors and the tension on the tape is precisely set by a servo system, quick access can be made.

#### Dynamic tracking\* playback

The playback picture without guard band noise can be seen in still mode, jog mode and shuttle mode of -1 to +3 times normal speed.

#### Video monitor function

The recorded picture can be simultaneously played back while recording or editing is being performed.

#### Digital time counter

The time counter indicates the amount of tape advancement at normal speed in hours, minutes, seconds and frames by counting the CTL signals. It can also indicate the lap time of editing.

#### Automatic/manual video recording systems

System provides a choice of either AUTO or MANUAL video recording level control.

#### Audio system

The audio recording and playback levels can be adjusted separately. If necessary, a limiter can be activated so that virtually distortion-free recordings of sudden, very strong input signals can be made. The CH-1 and CH-2 audio signals can be mixed while recording.

#### Editing/duplicating connectors

DUB IN and DUB OUT connectors permit editing and duplicating of video signals with little degradation, even over several generations.

#### Time base corrector (TBC) connection

The BVU-820P is provided with an external subcarrier input connector (SC IN) and an external sync input connector (EXT SYNC IN) which allow it to be connected to a time base corrector. It is also possible to connect an external dropout compensator (from a TBC, etc.) to the BVU-820P's RF OUTPUT connector. A time base corrector such as a BVT-2000P can be employed.

#### Auto rewind/auto stop

Auto rewind function automatically rewinds the tape to the beginning at the end of the tape. Auto stop function automatically stops the tape at the top of the tape.

#### Indicator lamps

These lamps are conveniently located on the front panel, notifying the operator of the conditions of the framing servo lock, of internal moisture condensation, time code recording/playback and of the operation of the capstan and drum servo lock.

#### Plug-in boards and modules

Plug-in boards and modules are designed for the ease of the service and maintenance by simply removing the top panel.

#### Mountable in standard 19" rack

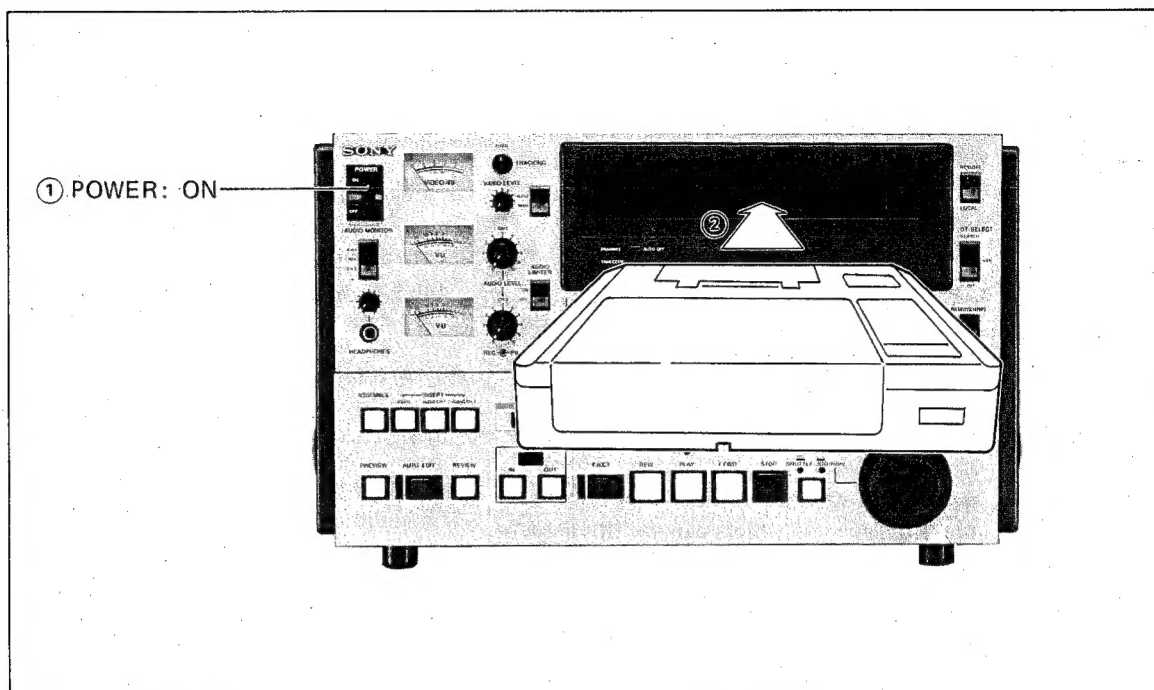
The BVU-820P is mountable in a standard EIA 19" rack.

\* "Dynamic tracking" is a trademark of Sony Corporation.



## 1-2. CASSETTE INSERTION AND REMOVAL

### TO INSERT A CASSETTE

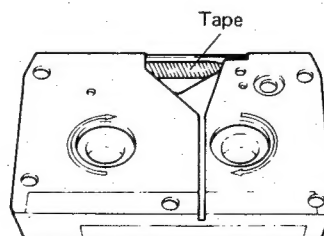


- The tape will be automatically threaded, the drum will rotate and a still picture will be displayed.

### TO REMOVE A CASSETTE

Press the EJECT button while the POWER switch is set to ON.

- Notes:**
- Use Sony U-matic (or its equivalent) type KCA-60 (60 minutes) and KCS-20 (20 minutes) videocassette tapes with this machine.
  - Remove the cassette after every use before the power is turned off.  
If you have turned off the power with the cassette in, turn on the power (The EJECT lamp will light for a moment and then the STANDBY and the STOP lamp will light.). After the STOP lamp lights, press the EJECT button to eject the cassette.
  - When over-wound tape cassette is threaded, the machine automatically detects it and goes into fast forward or rewind mode in order to prevent accidental head tip damage by the leader tape. Only if a KCA cassette in which the leader strip of the tape end has accidentally been drawn out is inserted, the cassette will be automatically ejected. In this case, turn the supply reel by hand until the end-leader strip is wound onto the supply reel and re-insert the cassette.

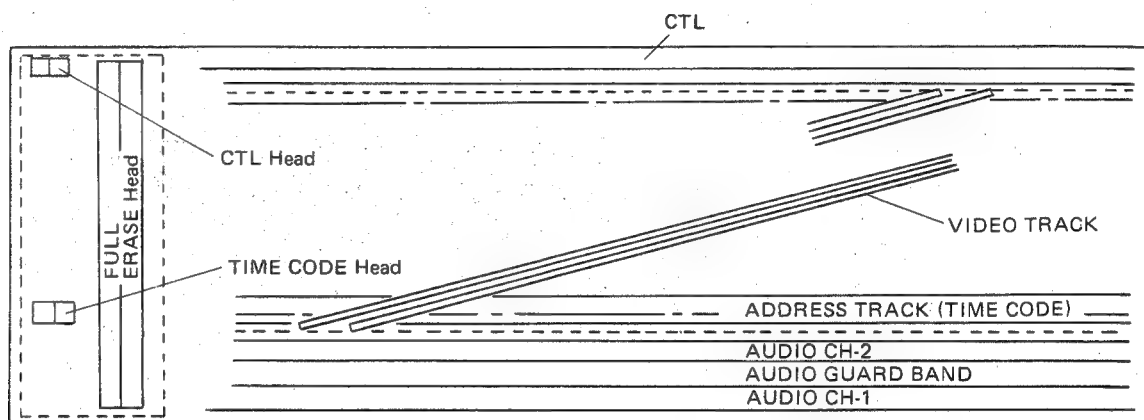




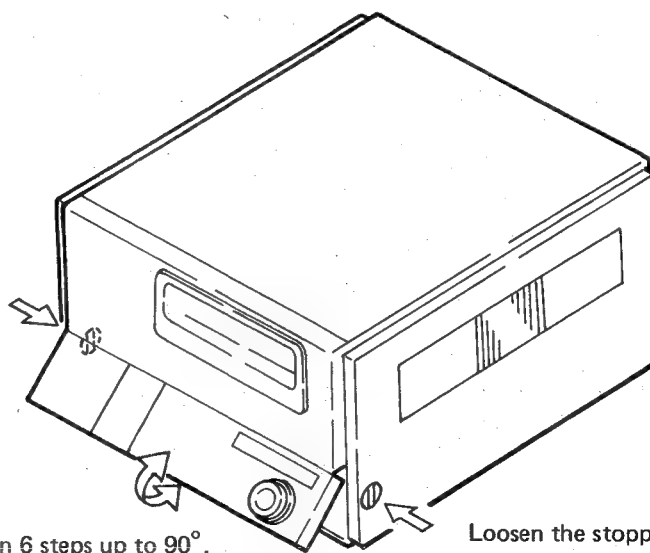
To keep a recorded program from being accidentally erased.

Remove a small round red cap on the bottom of a cassette, so that the record function cannot be activated. If you wish to record on a cassette which has had the cap removed, replace the cap again. In normal use, keep this cap in place.

- The illustration below shows the tape pattern recorded using this machine with the time code generator.



#### CONTROL PANEL POSITIONING

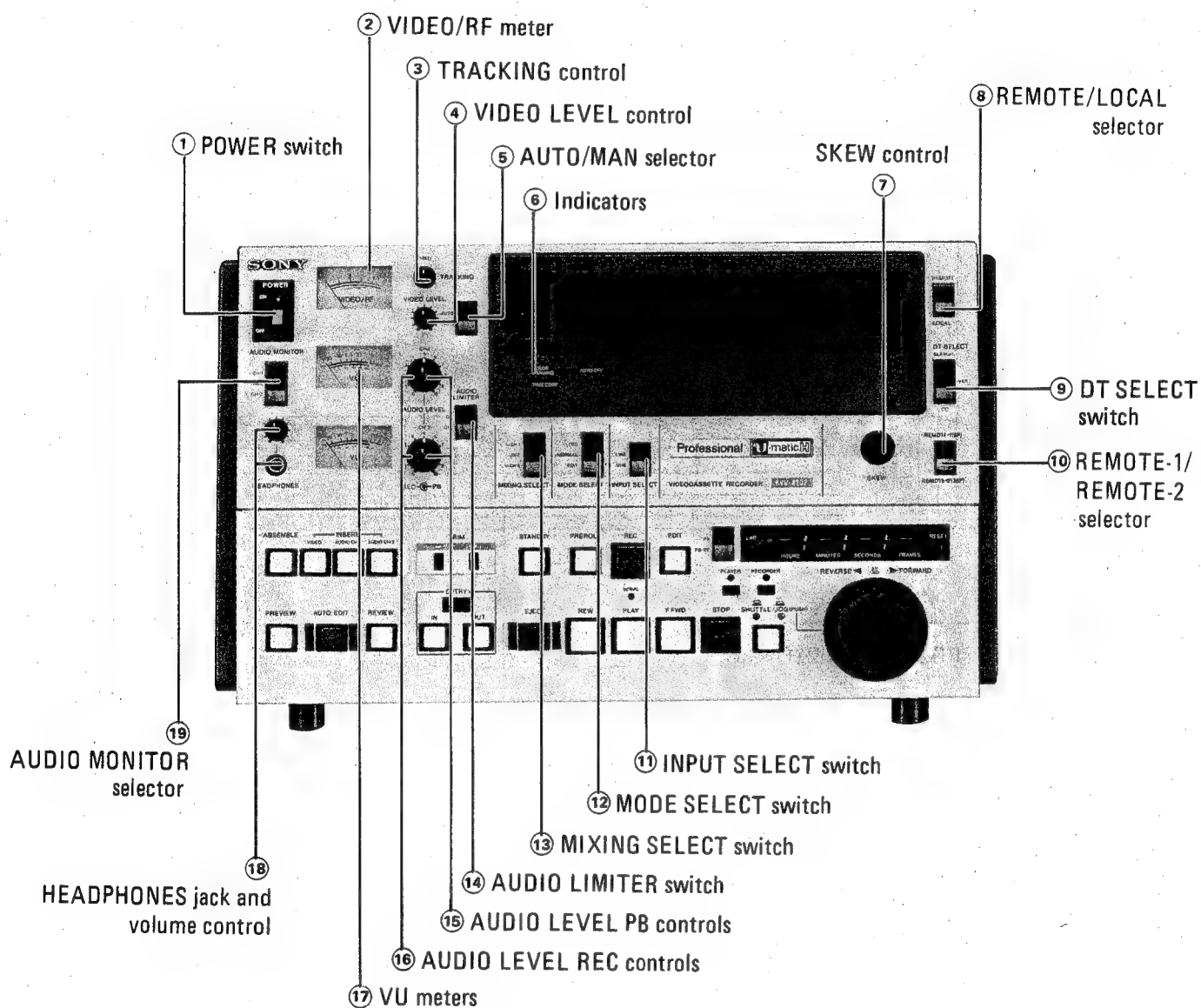


- The control panel can be detached for full function remote control by cable. For details, see section 2.



# 1-3. LOCATION AND FUNCTION OF CONTROLS

## FRONT PANEL





① **POWER switch**

Press ON to turn on the power. The meters and the counter figure 0:00:00:00 will light up.

② **VIDEO/RF meter**

Indicates the input video level during recording, simultaneous playback or E-to-E mode.  
Indicates the playback FM signal level (tracking level) during playback.

③ **TRACKING control**

This control adjusts the tracking of the tape during playback. When the DT SELECT switch ⑨ is set to OFF, the tracking with the R/P (record/playback) head is adjusted, and when the switch is set to SEARCH or VAR, the tracking with the DT (dynamic tracking) head is adjusted.  
Normally, set this control to the center FIXED position.

When a noise appears in the playback picture, turn this control to the left or right so that the VIDEO/RF meter ② needle points to the maximum value. After the playback of a tape with noise, return the control to the FIXED position.

While recording, always set this control to the FIXED position. If you adjust the control during recording, the playback picture may be unstable at this point.

④, ⑤ **VIDEO LEVEL (AUTO/MAN) selector and control**

**AUTO:** The sync AGC circuit is activated and the video input level is automatically adjusted. The sync AGC circuit detects the input sync signal level and provides automatic gain control.

**MAN:** The input video level during recording E-to-E mode can be adjusted manually. Turn the VIDEO LEVEL control so that the pointer of the VIDEO/RF meter ② is in the blue zone.

⑥ **Indicators**

**FRAMING:** Lights when the COLOR FRAMING switch on the rear panel is set to ON and the color framing mechanism is activated.

**TIME CODE:** Lights when the time code signals are being recorded or played back.

**AUTO OFF:** Lights when the moisture condensation is detected inside the unit or while the irregular tape tension is detected.

⑦ **SKEW control**

This control adjusts the tension of the tape. The top of the picture may be distorted if the tape has been recorded on a unit-under abnormal tension condition. Turn this control so that you obtain the best possible picture. This control automatically returns to the FIXED position when the unit is set in the record mode.

- This control does not function in the dynamic tracking playback mode.

⑧ **REMOTE/LOCAL selector**

**REMOTE:** When the unit is to be remotely controlled by a BVU-800P, another BVU-820P or an editing control unit connected to the REMOTE connector of the unit, set this switch to REMOTE. The function buttons (except the STOP and EJECT buttons) do not operate.

**LOCAL:** When the unit is to be operated by its own function buttons or when the unit is to be used as a recorder and to remotely operate a BVU-800P or another BVU-820P connected to the REMOTE-1 (9P) connector as a player.

⑨ **DT SELECT switch**

Select the head for playback, the R/P head or DT head.

**SEARCH:** The DT head is used for dynamic tracking playback. With the search dial, the playback speed is controlled from -10 to +10 times normal speed, but the noiseless playback picture can be obtained from -1 to +3 times normal speed.

**VAR:** The DT head is used for dynamic tracking playback. The search dial controls the playback speed from -1 to +3 times normal speed and the dynamic tracking playback is possible at any position of the dial.

**OFF:** R/P head is used.

- This switch does not affect the recording and editing.

⑩ **REMOTE-1 (9P)/REMOTE-2 (36P) selector**

When the REMOTE/LOCAL selector ⑧ is set to REMOTE, set this selector to the appropriate position.

**REMOTE-1:** When the 9-pin REMOTE-1 (9P) connector is used.

**REMOTE-2:** When the 36-pin REMOTE-2 (36P) connector is used.

⑪ **VIDEO INPUT SELECT switch**

Selects the video signals to be recorded.

**LINE:** Signals from the VIDEO IN connectors will be recorded.

**DUB:** Signals from the DUB connector will be recorded.

⑫ **MODE SELECT switch**

Selects the reference signal for servo lock.

**TBC:** When playing back with a TBC connected

**NORMAL:** When playing back without a TBC connected or recording

**EDIT:** When editing

Regarding the relationship between this switch and the SERVO LOCK selector on the rear panel, see the table in "MODE SELECT SWITCH AND SERVO LOCK SELECTOR".

⑬ **MIXING SELECT switch**

Selects the channel the mixed audio signals of CH-1 and CH-2 are to be recorded.

**to CH-1:** The mixed signal will be recorded on CH-1. (The audio signal of CH-2 will be recorded on CH-2.)

**OFF:** The audio signal of CH-1 and CH-2 will be recorded on CH-1 and CH-2, respectively.

**to CH-2:** The mixed signal will be recorded on CH-2. (The audio signal of CH-1 will be recorded on CH-1.)

This switch also selects the channel the mixed audio signals are to be output in the E-to-E mode.

⑭ **AUDIO LIMITER switch**

The limiter control circuit is actuated when this switch is set to ON. The circuit limits sudden surges of input signals to a fixed level during recording so that satisfactory recording characteristics can be obtained with low distortion.

⑮ **AUDIO LEVEL PB controls (The inner control)**

Adjust the output audio level of CH-1 and CH-2. When the unit is in the playback mode, turn this control so that the maximum value on the VU meter ⑰ is 0 VU.

⑯ **AUDIO LEVEL REC controls (The outer control)**

Adjust the input audio level of CH-1 and CH-2. When the recorder is in the E-to-E mode, turn this control so that the maximum value on the VU meter ⑰ is 0 VU.

⑰ **VU meters**

Indicate the input audio level when the unit is in the record or E-to-E mode, and the output audio level when the unit is in the playback mode.

⑱ **HEADPHONES jack and volume control**

Connect 8-ohm stereo headphones here. The audio during recording, edit-recording or playback can be monitored. The volume is adjusted with this control.

⑲ **AUDIO MONITOR selector**

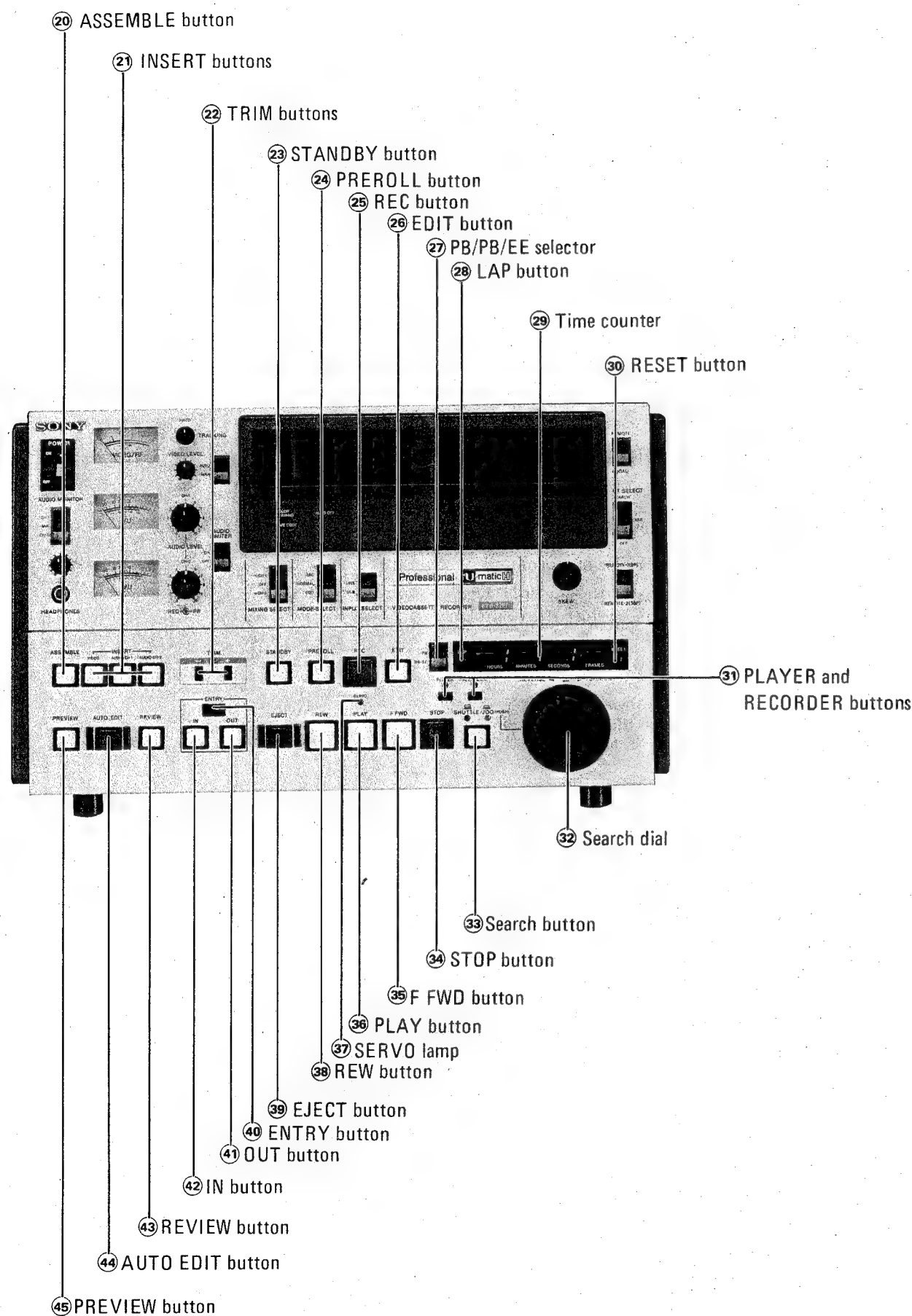
Selects the audio output from the HEADPHONES jack ⑱ and MONITOR connectors on the rear panel.

**CH-1:** Audio channel 1

**MIX:** Both channels 1 and 2 from the HEADPHONES jack or both channels mixed from the MONITOR and AUDIO OUT MONITOR connectors.

**CH-2:** Audio channel 2





## 20 ASSEMBLE button

Press this button to set the unit in the assembly edit mode. Pressing the button turns it on and pressing it again turns it off.

When this button is pressed, the R/P head will function even if the DT SELECT switch is set to VAR or SEARCH.

## 21 INSERT buttons

Selects the input signal for insert editing. Pressing the button turns it on and pressing it again turns it off.

When this button is pressed, the R/P head will function even if the DT SELECT switch is set to VAR or SEARCH.

## 22 TRIM buttons

The memorized edit-in and edit-out points can be moved any number of frames. While pressing the IN or OUT button, press the appropriate button.

## 23 STANDBY button

While the power is on, the STANDBY lamp lights indicating that the drum rotates and the unit is in the standby mode.

When this button is pressed during the stop mode, the drum will stop rotating and the tension on the tape is slackened, which protects the video head from being clogged. To put the unit in the stop mode or in other function mode, press the STANDBY button or the desired function button (except the STOP button).

## 24 PREROLL button

Press this button to run the tape at high speed to a preroll point 10 seconds (or 5 seconds depending on the setting of the preroll time switch) prior to the edit-in point.

If the edit-in point has not been entered and this button is pressed, the point where the button has been pressed will be entered as the edit-in point and the preroll will proceed.

## 25 REC (record) button

Press this button and the PLAY button simultaneously to set the unit in the record mode.

While this button is pressed in the play, search, fast forward or rewind mode, the E-to-E mode video and audio can be monitored. Release the button to set the unit in the same mode as before the button was pressed. In the stop mode, the E-to-E mode picture and audio are kept monitored when the button is pressed and released. Press the STOP button to set the unit in the previous mode.

## 26 EDIT button

Press this button and the PLAY button simultaneously for manual editing.

While this button is pressed in the play, search, fast forward or rewind mode, the selected E-to-E mode video and audio can be monitored. Release the button to set the unit in the same mode as before the button was pressed. In the stop mode, the selected E-to-E mode picture and audio are kept monitored when the button is pressed and released. Press the STOP button to set the unit in the previous mode.

## 27 PB/PB/EE selector

Selects the video and audio to be monitored. When the PB/PB/EE selector is set to PB, the simultaneous playback picture can be seen in the record or editing mode. For details, refer to the table on page 1-15.

## 28 LAP button

When this button is pressed, the lap time will be indicated by the time counter.

## 29 Time counter

Indicates how much the tape has advanced at normal speed in hours, minutes, seconds and frames.

## 30 RESET button

Press this button to set the counter number to "0:00:00:00". The memorized counter numbers of edit-in and edit-out points are cleared when this button is pressed.

## 31 PLAYER and RECORDER buttons

When two BVU-820Ps, or a BVU-820P and a BVU-800P are connected for editing, the PLAYER button on the recorder is used to remotely control the player.

RECORDER button: Press this button to use the function buttons on the recorder in the usual way.

PLAYER button: Press this button so that the standby, eject, fast forward, play, rewind, stop, shuttle, jog, preroll, entry in/out, trim and time counter functions of the player can be remotely controlled with the buttons on the recorder.

## 32 Search dial

This dial is used to quickly locate the desired editing points.

Pressing the dial in sets the unit in the jog mode and pressing it again sets the unit in the shuttle mode. The appropriate lamp lights.

SHUTTLE: Rotate the dial to the right or left and the tape runs in forward or reverse direction at a speed corresponding to the dial setting. The possible playback speed is as follows: When the DT SELECT switch is set to SEARCH or OFF, 1/30, 1/10, 1/5, 1/2, 1, 2, 5 and 10 times in either direction. At the click position, tape speed is 10 times normal speed and at the center position, a still picture is obtained.

When the DT SELECT switch is set to VAR, At the fully clockwise position, 3 times normal speed in forward direction, at the center position, a still picture and at the fully counterclockwise position, normal speed in reverse direction is obtained.

JOG: Rotate the dial to the right or left. The tape moves in the direction and at the speed of rotation, from 0 to 1 normal speed. When you stop rotating the dial, a still picture will be obtained.

- When the power is turned on, be sure to set the dial to the ■ position once before it is used.



③③ Search button

Press this button to set the unit in the search mode.

③④ STOP button

Press this button to set the unit in the stop mode. The reel motor stops, the pinch roller is released, the drum rotates and the tape is threaded.

On a still picture, guardband noise may appear even if the DT SELECT switch is set to VAR or SEARCH.

③⑤ F FWD (fast forward) button

Press this button to advance the tape rapidly.

③⑥ PLAY button

Press this button to play back the tape.

Press this button and the REC button simultaneously to record.

During playback, press this button and the EDIT button simultaneously to edit manually.

During manual recording, press this button to stop the recording.

③⑦ SERVO lamp

This lamp lights when the drum servo and the capstan servo are locked.

③⑧ REW (rewind) button

Press this button to rewind the tape.

③⑨ EJECT button

When this button is pressed, the tape is unthreaded and the cassette is ejected. The counter is reset to "0 : 00 : 00 : 00" when the time counter functions in the CTL mode.

- Be sure to eject the cassette after every use before the power is turned off.

④① ENTRY button

Press this button and the IN or OUT button simultaneously to enter the edit-in or edit-out point.

④② OUT button

When this button and the ENTRY button are pressed simultaneously, the edit-out point will be entered.

When this button is pressed, the edit-out point frame number will be displayed on the time counter.

④③ IN button

When this button and the ENTRY button are pressed simultaneously, the edit-in point will be entered.

When this button is pressed, the edit-in point frame number will be displayed on the time counter.

④④ REVIEW button

Press this button to review the edit-recorded picture and sound.

④⑤ AUTO EDIT button

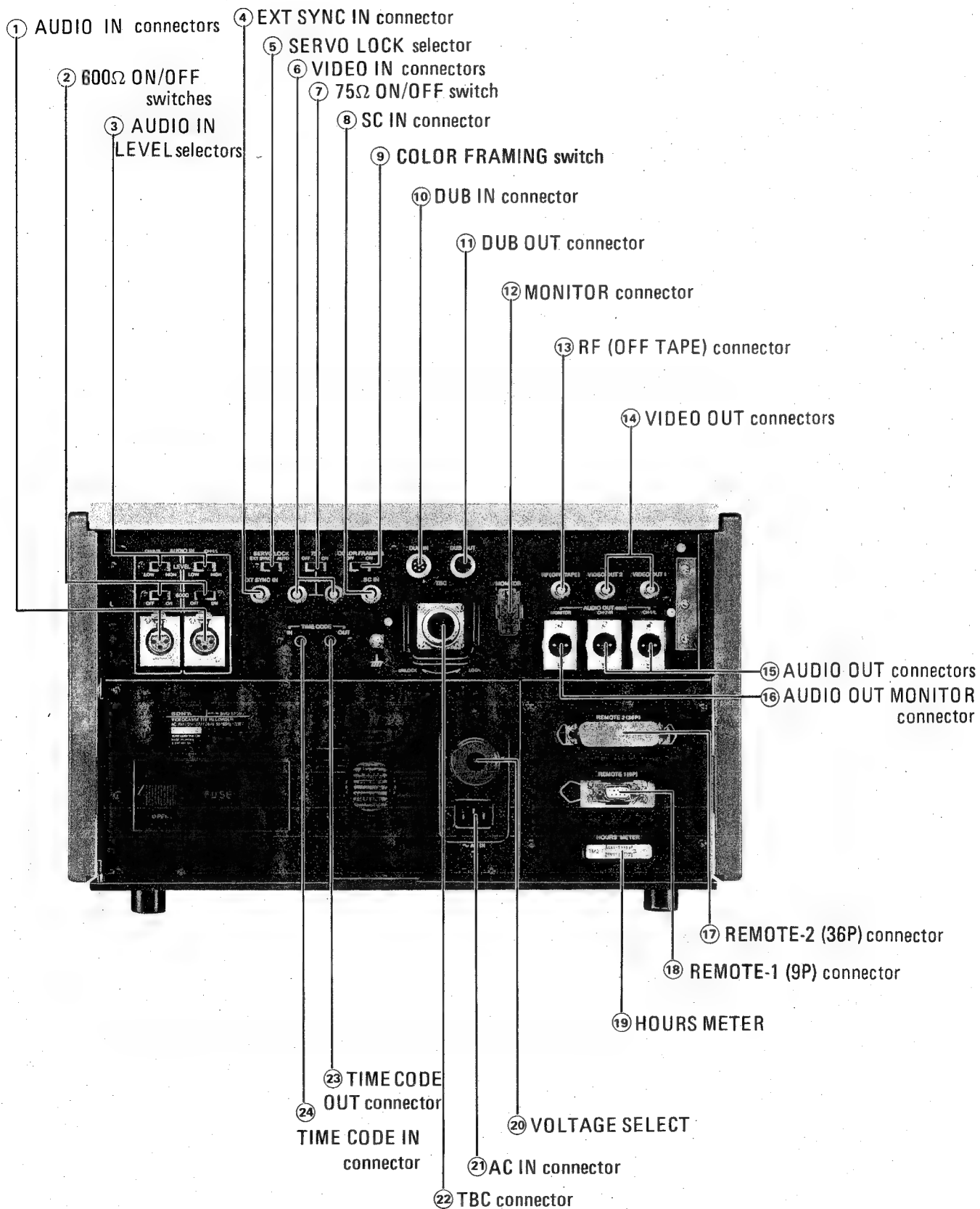
Press this button for automatic edit-recording.

④⑥ PREVIEW button

Press this button for an edit-recording rehearsal. The edited tape to be recorded can be monitored prior to the actual recording.



# REAR PANEL





① **AUDIO IN connectors (CH-1/CH-2) (XLR female)**

The audio input signals from microphones or audio equipment are connected to these connectors. Input level and input impedance are selected by the 600Ω ON/OFF switches ② and AUDIO IN LEVEL selectors ③.

② **600Ω ON/OFF switches (CH-1/CH-2)**

The input impedance can be selected when the AUDIO IN LEVEL selectors ③ are set to HIGH.

ON: 600Ω

OFF: 10kΩ

③ **AUDIO IN LEVEL selectors**

These selectors select the input level of the AUDIO IN connectors ①.

HIGH: +4 dB (for line input)

LOW: -60 dB (for mic input)

④ **EXT SYNC IN (external sync in) connector (BNC)**

Accepts the external sync signal (0.2 - 5 Vp-p). A video signal (1 Vp-p) can also be fed.

⑤ **SERVO LOCK selector**

**AUTO:** Normally, set the switch to this position. During recording, the video signal from the VIDEO IN or DUB IN connector is selected as the reference signal. During playback, the signal will be selected as shown in the table in "MODE SELECT SWITCH AND SERVO LOCK SELECT-OR".

**EXT SYNC:** Sets the unit to be driven by the external sync signal, regardless of the position of the MODE SELECT switch on the front panel.

⑥ **VIDEO IN connectors (BNC)**

These are for the recording or edit-recording video source. Of these two connectors, one can be used as a looping output (bridge connection) connector to other video equipment. When only one of these connectors is to be used, set the 75Ω ON/OFF switch ⑦ to ON.

⑦ **75Ω ON/OFF switch**

This is the video in 75Ω termination switch.

ON: Normal position

OFF: When one of the VIDEO IN connectors is being used as a looping output connector.

⑧ **SC IN (subcarrier in) connector (BNC)**

This subcarrier input connector is for driving the playback chrominance signal with an external subcarrier (4.43 MHz). A time base corrector is usually connected to this connector.

⑨ **COLOR FRAMING switch**

**ON:** If the color framing circuit is to be activated during auto edit recording.

**OFF:** If the color framing circuit is not to be activated during auto edit recording.

- The preroll time should be set to 10 seconds if the color framing circuit is activated.

- This switch has no effect except in the auto edit record mode.

- During editing with the BVT-500P, the color framing circuit cannot be activated when the DUB IN connector on the recorder and the DUB OUT connector on the BVT-500P are connected.

Connect the VIDEO IN connector on the recorder to the VIDEO OUT connector on the BVT-500P.

⑩ ⑪ **DUB IN/DUB OUT connectors**

(7-pin, IN: male; OUT: female)

By sending video signals from the player to the recorder along the accessory dubbing cable, it is possible to dub and edit-record video signals, realizing better picture quality than can be achieved by dubbing signals from the usual video outputs to inputs.

⑫ **MONITOR connector (8-pin)**

Connect a color monitor with a monitor connecting cord. The audio output signal from this connector is selected by the AUDIO MONITOR selector and the MIXING SELECT switch on the front panel.

This is the output connector.

⑬ **RF connector (BNC)**

The undemodulated FM signal is fed out. An external dropout compensator can be connected when the built-in DOC is not being used.

⑭ **VIDEO OUT connectors (BNC)**

Output signals are provided to be able to connect a video monitor, recorder, time base corrector, etc. simultaneously.

⑮ **AUDIO OUT connectors (CH-1/CH-2) (XLR male)**

Output signals via the AUDIO LEVEL control on the front panel, are available at these connectors.

⑯ **AUDIO OUT MONITOR connector (XLR male)**

Connect the audio monitor system. The output signal is selected by the AUDIO MONITOR selector and the MIXING SELECT switch on the front panel.

⑰ **REMOTE-2 (36P) connector (36-pin)**

Connect a Sony BVE series editing control unit, such as the BVE-500ACE or 5000P, with a 36-pin remote cable (optional).

⑱ **REMOTE-1 (9P) connector (9-pin)**

Connect another BVU-820P, a BVU-800P, a BVE-800, a BVH-2000PS or a DTR-2000 for editing or remotely-controlling with the 9-pin remote control cable (supplied).

⑲ **HOURS METER**

This meter operates while the tape is running to record the total elapsed time the unit is in the record, playback, editing, search, fast forward or rewind mode to a maximum of 1000 hours.

⑳ **VOLTAGE SELECT**

Adjustable to 100, 120, 220 or 240 V AC

㉑ **AC IN connector**

Connect to a wall outlet with the AC power cord supplied.

㉒ **TBC connector**

A time base corrector can be connected.

㉓ **TIME CODE OUT connector (RCA phono)**

The played back time code signal is supplied from this connector. A time code reader can be connected. In the record or E-to-E mode, the time code signal from the TIME CODE IN connector ㉔ will be supplied.

㉔ **TIME CODE IN connector (RCA phono)**

This is to record the time codes on the tape track. Connect a time code generator.



1-4. RECORDING

1. PREPARATION

Set the controls to the appropriate position as follows.

AUDIO IN LEVEL: LOW or HIGH

LOW: -60 dB, 3 k-ohms (for mic connection)

HIGH: +4 dB, 10 k-ohms/600 ohms (for line use)

When this switch is set to this position, set the 600  $\Omega$  switch as follows.

ON: 600 ohms

OFF: 10 k-ohms

75  $\Omega$  ON/OFF: ON

When a looping output is employed, set this switch to OFF.

SERVO LOCK:

AUTO:

Normal position

EXT SYNC:

For external sync

(Refer to page 1-16.)

Rear panel

Audio input

Video input

AC power

For connections, refer to page 1-54.

Insert a videocassette

The red cap should be placed.

TRACKING: FIXED

POWER: ON

AUDIO MONITOR:

MIX, normally

Front panel

MIXING SELECT: OFF, normally

MODE SELECT: NORMAL

INPUT SELECT: LINE or DUB

LINE: The video signal of the unit connected to the VIDEO IN connector will be recorded.

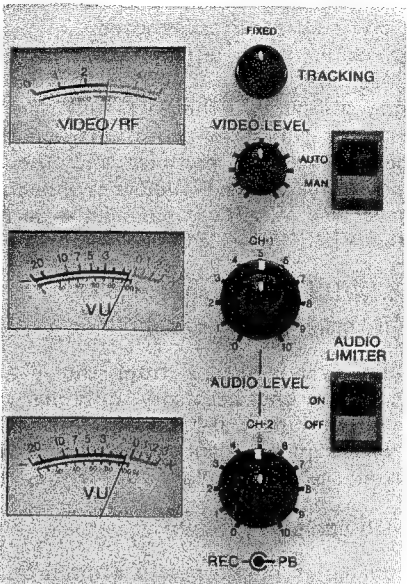
DUB: The video signal of the player connected to the DUB IN connector will be recorded.

REMOTE/LOCAL:

LOCAL

PB/PB/EE: PB/EE, normally

2. VIDEO AND AUDIO LEVEL ADJUSTMENTS



Video level

To adjust the video level automatically, set the VIDEO LEVEL switch to AUTO.

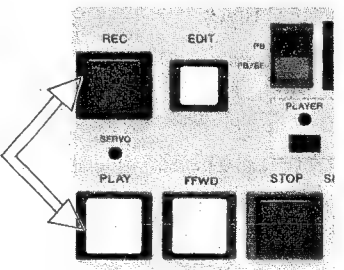
To adjust the video level manually, set the VIDEO LEVEL switch to MAN and turn the VIDEO LEVEL control so that the meter's pointer is within the blue zone.

Audio level

Set the AUDIO LIMITER switch to OFF. Adjust the AUDIO LEVEL controls for channels 1 and 2 so that AUDIO LEVEL meters read approximately zero at the maximum deflection.

If you want to record audio using the limiter, set the AUDIO LIMITER switch to ON.

3. TO START RECORDING



Press the REC and PLAY buttons simultaneously.

It takes several seconds for the drum and capstan servo to lock. The servo lamp will light.

The lamps lit: REC, PLAY, STANDBY

To stop recording, press the STOP button.

The lamps lit: STOP, STANDBY

If the tape reaches the end, it will automatically rewind to the beginning and stop.



## TO MONITOR VIDEO AND AUDIO SIGNALS

**Video signals:** Can be monitored with a monitor connected to the VIDEO OUT connector or the MONITOR connector.

**Audio signals:** Can be monitored with audio systems connected to the AUDIO MONITOR connector, with a monitor connected to the MONITOR connector, or with a stereo headphones connected to the HEADPHONES jack. The signals to be monitored can be selected by using the AUDIO MONITOR selector as follows.



Audio channel 1

Both channels from the HEADPHONES jack

Mixed of both channels from the MONITOR connectors

Audio channel 2

## SETTING THE PB/PB/EE SELECTOR

This selector selects the picture and audio on the monitor.

Mode Selector position	Cassette up	Threading or unthreading	Play	Record	Edit	Search	Fast forward or rewind	Stop	When the standby mode is turned off
PB	EE	EE	PB	Video: Simul- taneous PB Audio: EE	Video: Simul- taneous PB Audio: EE	PB	PB	PB	PB
PB/EE	EE	EE	PB	EE	EE	PB	EE	EE	EE

While the REC button is pressed in the play, search, fast forward or rewind mode, the E-to-E mode picture and audio can be monitored. While the EDIT button is pressed, the E-to-E mode picture and audio selected by the ASSEMBLE or INSERT buttons can be monitored. When the button is released, the unit will be set to the prior condition.

In the stop mode, the E-to-E mode picture and audio are kept monitored when the REC or EDIT button is pressed and released. Press the STOP button to set the unit into the prior condition or press the proper button to set the unit into another mode.



## MODE SELECT SWITCH AND SERVO LOCK SELECTOR

These switches select the video signal from the VIDEO IN or DUB IN connector, the external signal from EXT SYNC IN connector or the internal sync signal as the reference signal for servo lock.

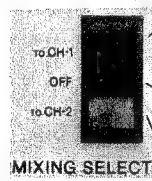
SERVO LOCK selector position		AUTO			EXT SYNC	
VTR operating mode		Recording	Playback, E-E		Recording	Playback, E-E
MODE SELECT switch position		EDIT, NORMAL, TBC	EDIT	NORMAL TBC	EDIT, NORMAL, TBC	
Input signal to VIDEO IN or DUB IN	EXT SYNC IN					
Yes	Yes	VIDEO	VIDEO (EXT SYNC)*	EXT SYNC (VIDEO)**	EXT SYNC IN	
Yes	No	VIDEO	VIDEO (Internal sync signal) *		VIDEO	VIDEO (Internal sync signal)*
No	Yes	EXT SYNC IN				
No	No	Internal sync signal				

\* When the player is in the mode other than playback during editing using the BVE-500ACE, BVE-800, two BVU-820Ps or a BVU-800P and a BVU-820P, the recorder's servo reference signal is as indicated in parentheses.

\*\* If one of the ASSEMBLE and INSERT buttons are pressed and lit, and the VTR is in the PLAY mode or the EDIT button is lit, the recorder's servo reference is as indicated in parentheses.

## MIXING THE AUDIO SIGNALS

The audio signals of channel 1 and channel 2 can be mixed during recording. It is also possible to record the mixed signal on either channel 1 or channel 2 by setting the MIXING SELECT switch as follows:

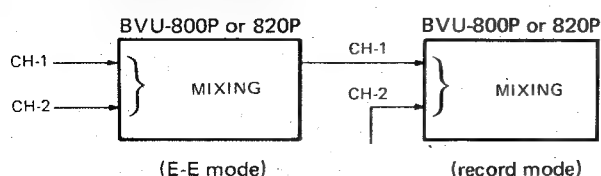


The mixed signal will be recorded on channel 1.  
(The audio signal of channel 2 will be recorded on channel 2.)

The audio signal of channel 1 and 2 will be recorded on the respective channels.

The mixed signal will be recorded on channel 2.  
(The audio signal of channel 1 will be recorded on channel 1.)

- The mixed audio input signals of channels 1 and 2 will be mixed recorded at the same level.
- When two BVU-820Ps or a BVU-800P and a BVU-820P are connected, three of audio signals can be mixed.



## TAPE PROTECTION

If the unit stays in the stop mode for more than 8 minutes, the unit will automatically turn off the standby mode (the drum stops rotating) to protect the tape and the video heads. If the tape is stopped in the search mode for more than 8 minutes, the tape will advance in forward direction at the 1/30 normal speed. To set the unit into the desired mode (except the stop mode), press the appropriate button. To set the unit into the stop mode, press the STANDBY button.

## MOISTURE CONDENSATION

If the moisture is condensed, the drum and the capstan motors stop and the cassette will be ejected. The AUTO OFF lamp on the front panel will light. Then the drum will begin rotating again. To operate the machine, wait until the AUTO OFF lamp will go off and about ten minutes will have passed.

- When a BVR series equipment is connected, the period of 10 minutes should be set on the equipment to enter the tape protection mode. For details, refer to the instruction manual furnished with the equipment.

## TIME CODE RECORDING

For simultaneous recording of time code, connect an EBU time code generator to the TIME CODE IN connector. No adjustment is necessary, as the time code is recorded with the limiter.

During recording, the TIME CODE lamp lights.



## 1-5. PLAYBACK

### 1. PREPARATION

Set the controls as follows.

#### SERVO LOCK:

AUTO:

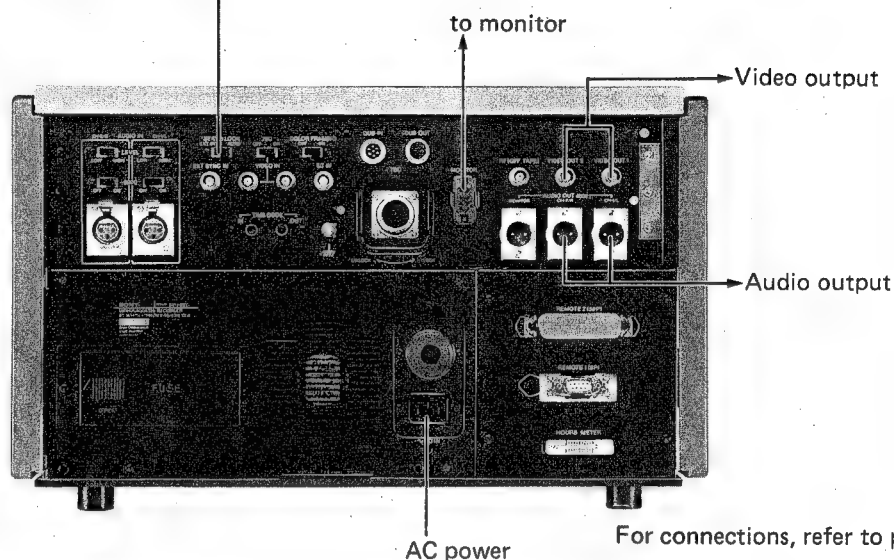
Normal position

EXT SYNC:

For external sync

(Refer to page 1-16.)

Rear panel



Insert a recorded videocassette.

TRACKING: FIXED

POWER: ON

AUDIO MONITOR:

MIX, normally

REMOTE/LOCAL:

LOCAL

DT SELECT: OFF

SKEW: FIXED

Front panel

MODE SELECT: NORMAL, normally

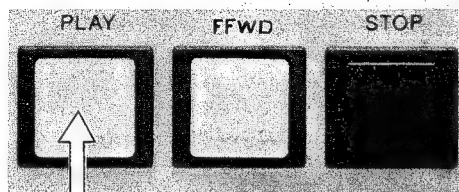
PB/PB/EE: PB, normally

INPUT SELECT:

When the video input signal is selected as a reference signal, set this switch to the position which indicates where the signal is connected.



## 2. TO START PLAYBACK



Press the **PLAY** button.

It will take several seconds for the drum and the capstan servo to lock. The servo lamp will light when the servo is locked.

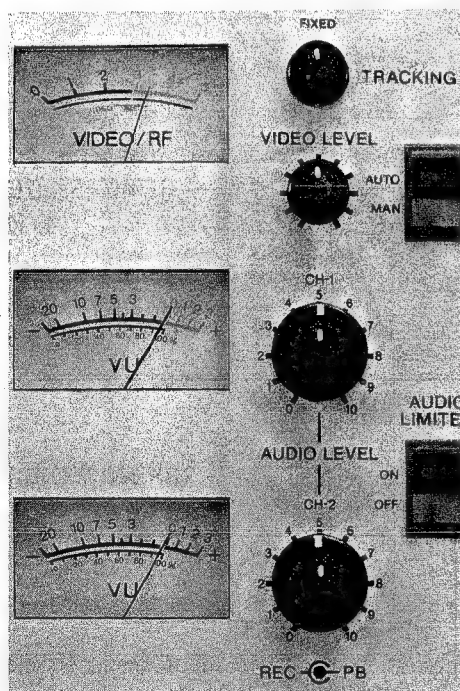
The lamps lit: **PLAY, STANDBY**

To stop playback, press the **STOP** button.

The lamps lit: **STOP, STANDBY**

If the tape reaches the end, it will automatically rewind to the beginning and stop.

## 3. ADJUSTMENTS



### TRACKING AND SKEW ADJUSTMENTS

Normally, set these controls at the **FIXED** position.

If a noise appears on the playback picture, Turn the **TRACKING** control to the left or right so that the pointer of the **VIDEO/RF** meter points as far to the right as possible.

- Be sure to set the **DT SELECT** switch to **OFF** during adjusting the tracking.
- When the playback of the particular tape is finished, return the control to the **FIXED** position.

If the top of the picture is distorted,

Turn the **SKEW** control to the position which gives the best possible picture.

### VIDEO AND AUDIO LEVEL ADJUSTMENTS

**Video level**

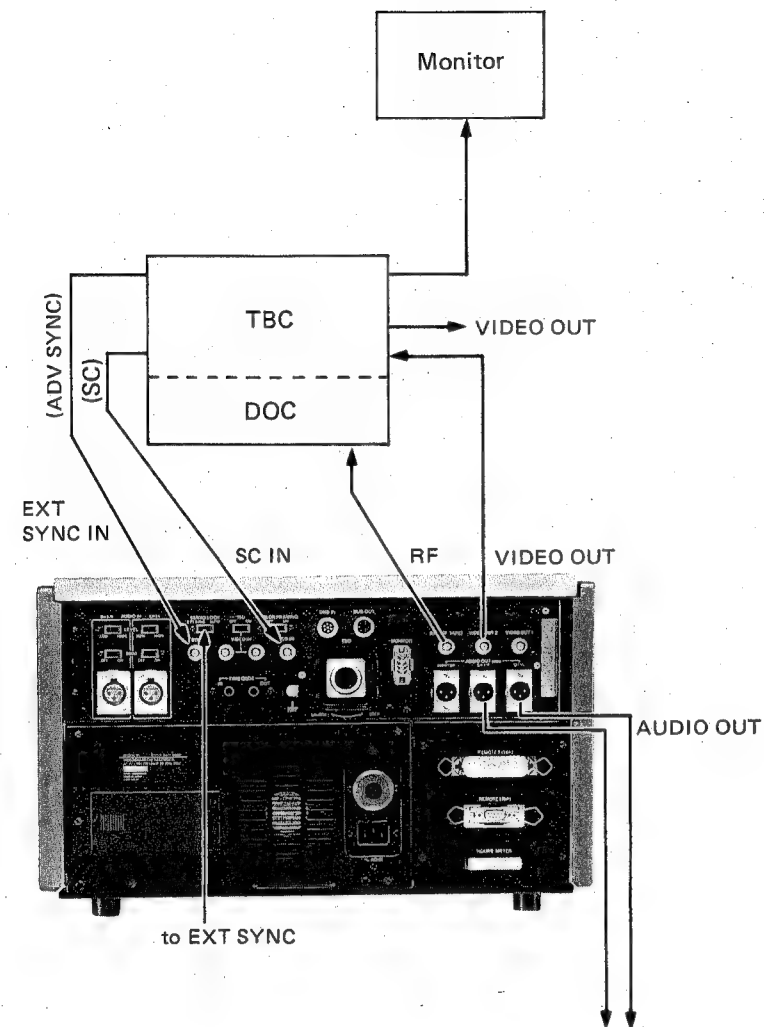
The video level is adjusted automatically.

**Audio level**

During playback, adjust the **AUDIO LEVEL** controls for channels 1 and 2 so that the **AUDIO LEVEL** meters read approximately zero at the maximum deflection.



## PLAYBACK WITH A TIME BASE CORRECTOR



Set the MODE SELECT switch on the front panel to TBC.

### TO MONITOR VIDEO AND AUDIO SIGNALS

Refer to page 1-15.

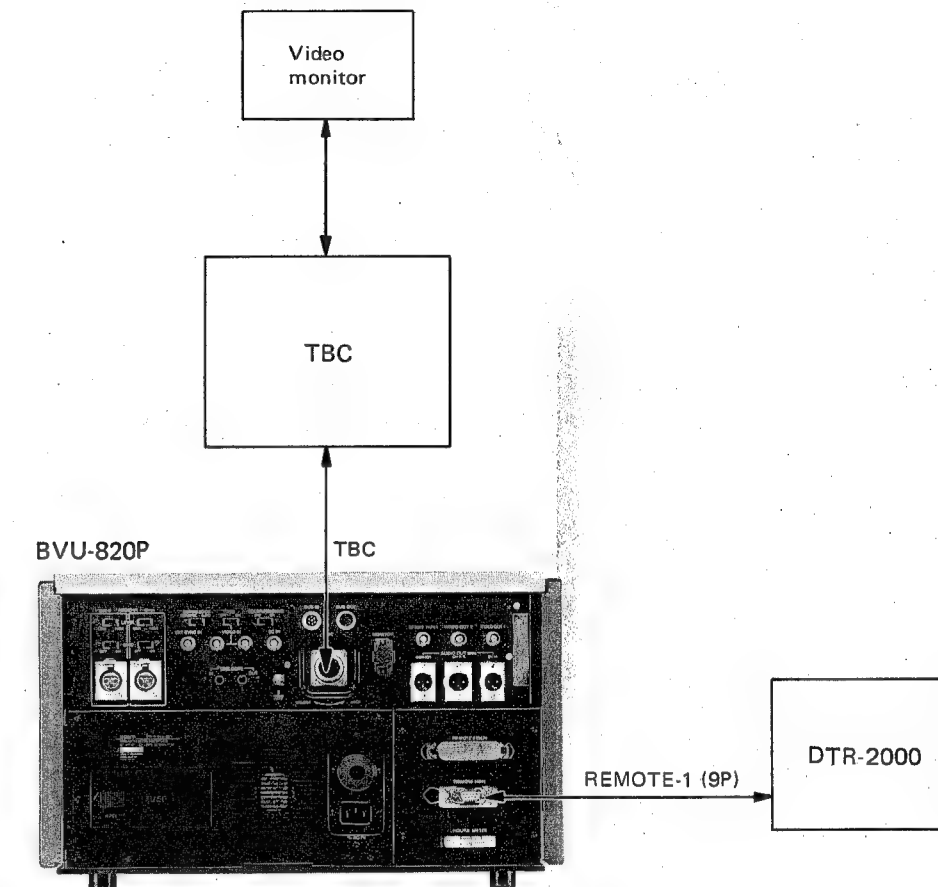
### AUTOMATIC RELEASE

Refer to page 1-16.

### TIME CODE PLAYBACK

For reading out the time code, connect an EBU time code reader to the TIME CODE OUT connector. During playback, the TIME CODE lamp lights.

## PLAYBACK WITH A DTR-2000



The following operation will be possible when the DTR-2000 dynamic control unit is used together.

- Up to five cue points can be memorized. The memory of more 150 cue points will be possible if an optional key board is installed.
- The data of the cue points can be kept by recording it on the audio track of the tape or by using the teletypewriter.
- Any cue point will be automatically searched for.
- The playback program at various kinds of speed up to 30 seconds can be memorized and be played back repeatedly.

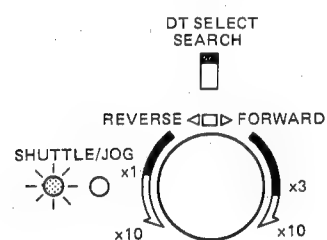


## DYNAMIC TRACKING PLAYBACK

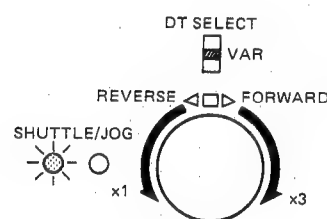
When the DT SELECT switch is set to SEARCH or VAR, the playback picture at  $-1$  to  $+3$  times normal speed can be seen without any guard band noise. This is called dynamic tracking playback.

- For dynamic tracking playback, be sure to use a time base corrector together, or the jitter or the picture distortion may occur.
- When the power is turned on or when the inserted cassette is changed, play the tape back in the normal playback mode for 8 seconds or more, then start dynamic tracking playback.

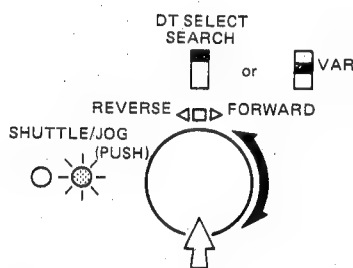
Set the DT SELECT switch to SEARCH or VAR and press the PLAY button. The normal speed dynamic tracking playback will begin. When the search dial is used, the following speed can be obtained.



The playback speed is varied from  $-10$  to  $+10$  times normal, but the dynamic tracking playback is possible within the range of  $-1$  to  $+3$  times normal speed.



When the dial is turned fully counterclockwise, the playback speed will be  $-1$  time normal, and at the fully clockwise position, the playback speed will be  $+3$  times normal. At any position, dynamic tracking playback picture is obtained.



When the search dial is pressed, the VTR is in the JOG mode and the dynamic tracking playback is performed at the speed of rotation. When the dial stops, a noiseless still picture is displayed.

■ : Dynamic tracking playback

### Notes:

- The picture quality played back with the R/P head is better than that with the DT head so that we recommend to play the tape back with the R/P head for duplicating tape or editing.
- To duplicate the dynamic tracking playback picture, the better results will be obtained when the signals are connected using the VIDEO OUT connector instead of the DUB OUT connector.

## Automatic change of head

### When the BVU-820P is used as a player

Even if the DT SELECT switch is set to SEARCH or VAR, the playback head is automatically changed from the DT head to the R/P head during preroll when the PREVIEW or AUTO EDIT button is pressed. Therefore the picture played back with the R/P head is fed from the player to the recorder during auto-editing independent of the DT SELECT switch setting. When the editing is finished, the DT head is automatically activated.

### Note:

The automatic change of playback head functions only when the BVU-820P, BVU-800P or BVE-800 is connected to the REMOTE-1 (9P) connector. If the REMOTE-2 (36P) connector is used or the other equipment is connected to the REMOTE-1 (9P) connector or the player is in the manual editing mode, this function does not operate. In this case, be sure to set the DT SELECT switch to OFF to perform editing.

### When the BVU-820P is used as a recorder

When the REC and PLAY buttons are pressed, or when the one of the ASSEMBLE or INSERT buttons is pressed, the R/P head is automatically activated even if the DT SELECT switch is set to SEARCH or VAR. However, when the search dial is turned after one of the ASSEMBLE or INSERT buttons is pressed with the DT SELECT switch set to SEARCH or VAR, the DT head is activated and a noiseless playback picture can be seen. Pressing the PREVIEW, AUTO EDIT or PLAY button reactivates the R/P head. This function is operative with the control panel of the BVU-820P or with the equipment connected to the REMOTE-1 (9P) connector or the REMOTE-2 (36P) connector.



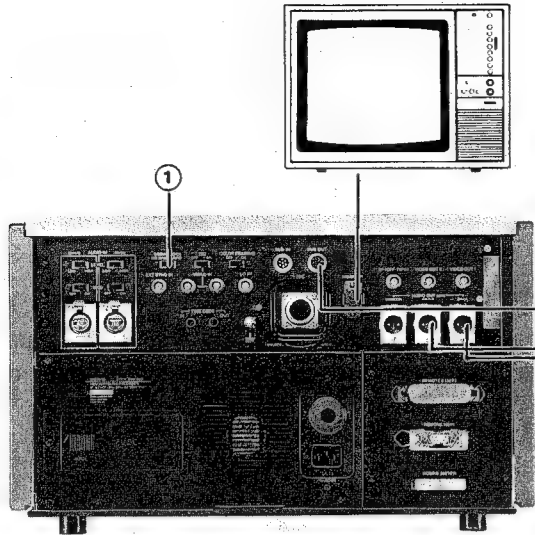
1-6. EDITING

1-6-1. Editing with Two BVU-820P Videocassette Recorders

1. PREPARATION

PLAYER

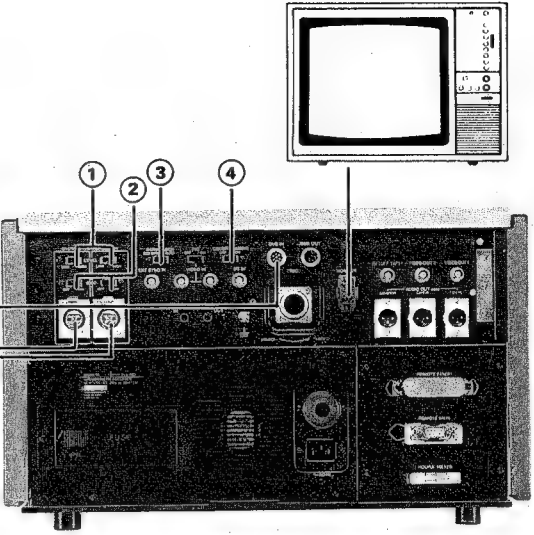
- ① SERVO LOCK:  
AUTO: Normal position  
EXT SYNC: For external sync.



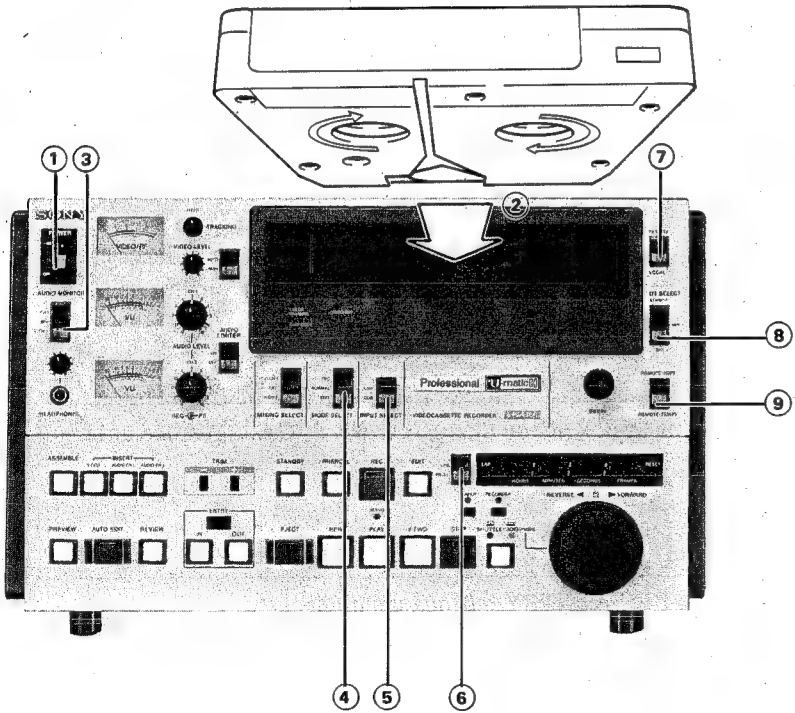
For connection, refer to the illustration in "CONNECTIONS".

RECORDER

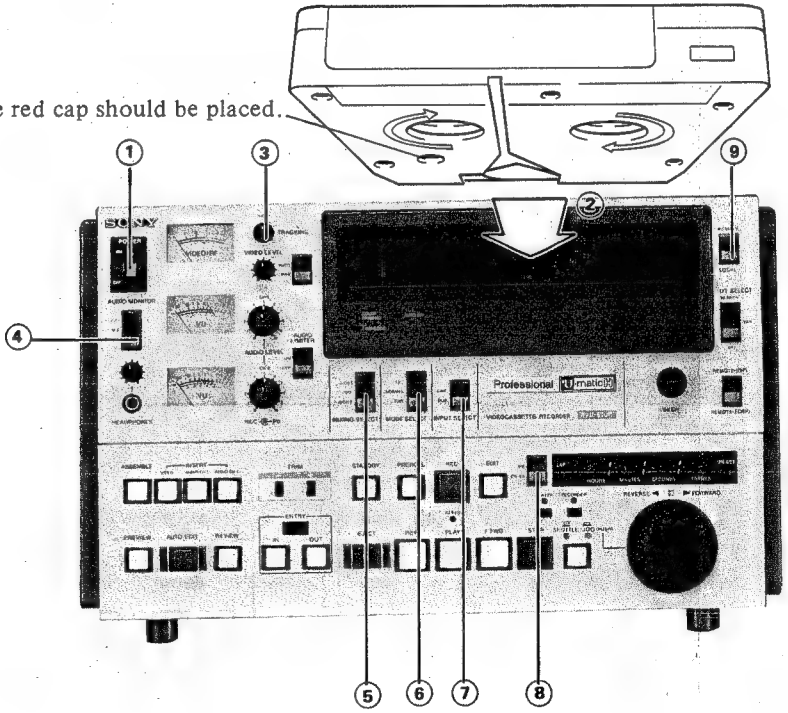
- ① AUDIO IN LEVEL: HIGH  
② 600  $\Omega$ : ON  
③ SERVO LOCK:  
AUTO: Normal position  
EXT SYNC: For external sync.  
④ COLOR FRAMING: ON  
When the color framing mechanism is not to be activated during auto edit-recording, set this switch to OFF.



- ① POWER: ON  
② Insert a recorded video cassette  
③ AUDIO MONITOR: MIX  
④ MODE SELECT: EDIT  
⑤ INPUT SELECT:  
When the video input signal is selected as a reference signal, set this switch to the position which indicates where the signal is connected.  
⑥ PB/PB/EE: PB  
⑦ REMOTE/LOCAL: REMOTE  
⑧ DT SELECT: OFF  
⑨ REMOTE-1/REMOTE-2: REMOTE-1  
Adjust the video and audio levels, tracking and skew as shown on page 1-18.



The red cap should be placed.



- ① POWER: ON  
② Insert a cassette to be edit-recorded.  
③ TRACKING: FIXED  
④ AUDIO MONITOR: MIX  
⑤ MIXING SELECT: OFF  
⑥ MODE SELECT: EDIT  
⑦ INPUT SELECT: DUB  
When the VIDEO IN connector is used for the video signal from the player, set to LINE.  
⑧ PB/PB/EE: PB/EE  
⑨ REMOTE/LOCAL: LOCAL  
Adjust the video and audio levels as shown on page 1-14.

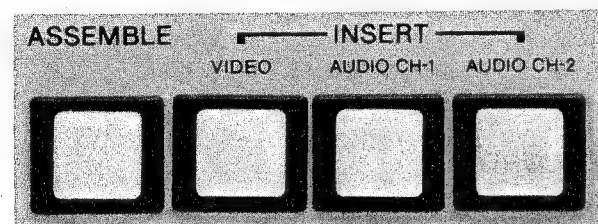


## 2. SELECT THE EDITING MODE



### ASSEMBLY EDITING

- 1 Press the RECORDER button on the recorder. The RECORDER lamp will light.
- 2 Press the ASSEMBLE button on the recorder.



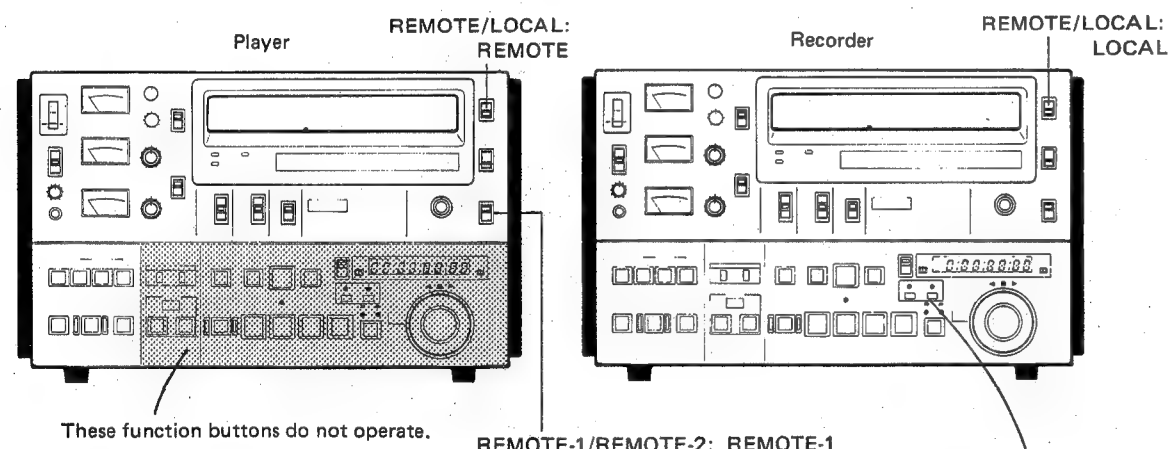
### INSERT EDITING

- 1 Press RECORDER button on the recorder. The RECORDER lamp will light.
- 2 Select the desired input signal with any or all of the INSERT buttons on the recorder. The signal is disconnected, when a button is pressed again.

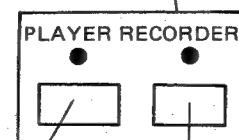
### IMPORTANT

When editing with two BVU-820P, or a BVU-800P and a BVU-820P videocassette recorders, the recorder front panel controls the recorder itself and plus, it remotely controls the standby, preroll, eject, fast forward, play, rewind, stop, search (jog and shuttle), entry in/out, trim, reset and time counter functions on the player.

On the subsequent pages, the edit operating procedure using only the front panel of the recorder is explained. The player is remotely controlled.



REMOTE-1/REMOTE-2: REMOTE-1



Press this button to use the function buttons for remote control of the player. The function lamps, search lamp and servo lamp will light as on the player.

Press this button to use the function buttons for the recorder itself.

- If you set the REMOTE/LOCAL selectors on both the recorder and player to LOCAL, the function buttons on both machines will control only those machines. In this case, the PREVIEW, AUTO EDIT and REVIEW buttons have to be used on the recorder.
- In case machine does not follow the functional command after pressing the function key, turn the POWER switch off to reset the machine and then turn it on to make sure that the machine operates properly.

## 3. DETERMINE THE EDIT-IN POINT AND EDIT-OUT POINT

The selected signals between the edit-in and edit-out points will be edited on the desired part of the tape on the recorder.

The edit operating procedure using only the front panel of the recorder is explained. The player is remotely controlled.

### EDIT-IN POINT FOR THE PLAYER

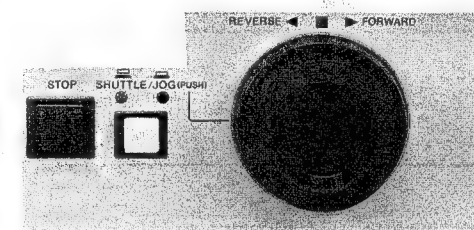
- 1 Press the PLAYER button.



The PLAYER lamp lights.

- 2 The SHUTTLE and JOG lamps to the left of the Search dial indicate whether the Search dial is in the shuttle or jog mode. Push the Search dial in so that the SHUTTLE indicator lights.

- 3 Turn the Search dial to control the tape speed.



The tape speed can be varied between 1/30, 1/10, 1/5, 1/2, 1, 2, 5 and 10 times normal speed in either direction. The IN and OUT lamps blink.

- To see a noiseless picture, set the DT SELECT switch to SEARCH or VAR. (For details, refer to "Dynamic tracking playback" on page 1-21.)
- When the dial is turned to the position at which a click is felt, the machine enters into the fast forward mode (x10). When the machine enters into the fast forward mode, the picture is stopped or distorted for a moment.

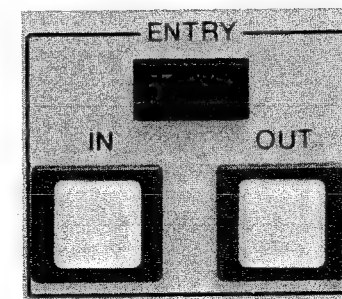
- 4 Approximately locate the beginning of the scene to be recorded by viewing the monitor connected to the player. At this point, press the Search dial in.

The still picture of this point will be displayed. The dial remains in the depressed position and the player is set in the JOG mode. The JOG lamp lights.

- 5 Rotate the Search dial to the right or left in the JOG mode until the desired edit-in point is displayed on the monitor.

The direction and speed of the tape in the jog mode depend on how rapidly clockwise or counterclockwise the Search dial is rotated. When you stop rotating the dial, you obtain a still picture again.

- 6 Press the IN and ENTRY buttons simultaneously.



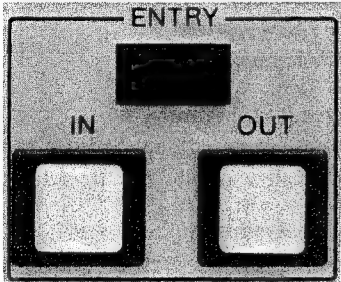
The counter number at this point is memorized as the edit-in point. The IN lamp lights. The first edit-in point should be at least 10 seconds after the beginning of the tape (or at least 5 seconds after the beginning of the tape when the preroll time switch is set to OFF).

To enter a different edit-in point, locate the new edit-in point and again press the IN and ENTRY buttons simultaneously.

The edit-in point can be entered not only in the stop and still modes but also in the play, search, fast forward and rewind modes.




## EDIT-OUT POINT FOR THE PLAYER

<p>① Locate the desired edit-out point in the same way as you located the edit-in point.</p>	<p>(Steps ① through ⑤ on the previous page.)</p>
<p>② Press the OUT and ENTRY buttons simultaneously.</p> 	<p>The OUT lamp lights.</p> <p>The counter number at this point will be memorized as the edit-out point.</p> <ul style="list-style-type: none"> <li>• If the same point is entered as the edit-in and the edit-out points or if the edit-out point is entered before the edit-in point, the edit-in point will be cleared. Enter the edit-in and edit-out points correctly.</li> </ul>

- The edit-out point should be entered into either the player or the recorder.

## EDIT-IN POINT FOR THE RECORDER

<p>① Press the RECORDER button.</p> 	<p>The RECORDER lamp will light.</p>
<p>② Locate the point on the tape from which the scene is to be recorded in the same way as you searched for the edit-in point on the player.</p>	<p>The IN lamp blinks.</p>
<p>③ Press the IN and ENTRY buttons simultaneously.</p>	<p>The IN lamp lights.</p> <p>The counter number at this point will be memorized as the edit-in point.</p> <p>The first edit-in point should be at least 10 seconds after the beginning of the tape (or at least 5 seconds after the beginning of the tape when the preroll time switch is set to OFF.)</p>

## EDIT-OUT POINT FOR THE RECORDER

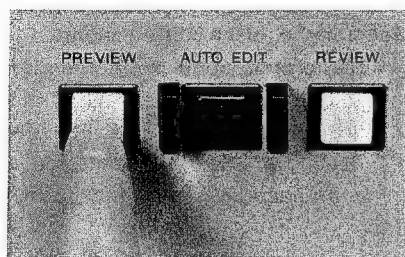
If the edit-out point is to be entered into the recorder, proceed as follows:

- 1) Locate the point where recording is to end in the same way as you searched for the edit-in point on the player.
  - 2) Press the OUT and ENTRY buttons simultaneously.
- The counter number at this point will be memorized as the edit-out point.



#### 4. TO REHEARSE EDITING: THE PREVIEW MODE

Once the edit-in and edit-out points have been set, you can rehearse the scene by pressing the PREVIEW button.



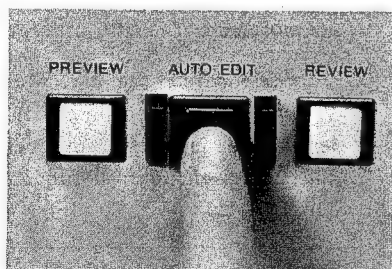
- ① After the edit-in and edit-out points have been set, press the PREVIEW button. The PREVIEW lamp will light.
- ② Watch the recorder's monitor. Check that the edit-in and edit-out points are correct and that the quality of the picture to be recorded is satisfactory.
- ③ If necessary, re-enter the edit-in and edit-out points and rehearse the scene again by pressing the PREVIEW button.

To stop the tape during previewing, press the STOP button. If you want to start automatic edit-recording during previewing, press the AUTO EDIT button.

#### 5. TO BEGIN EDIT RECORDING

Press the AUTO EDIT button.

The recording will automatically proceed.



- You can start automatic edit-recording during previewing or skipping previewing.



### When the edit recording is finished

When the recording of one scene (from the edit-in to the edit-out point) is finished, search for and enter the edit-in and edit-out points for the next scene, as described on the previous pages. You can also make the edit-out point of one scene as the next edit-in point for the recorder. For details, refer to page 1-37.

### To monitor the edit recording

You can monitor the recording from 10 seconds (or 5 seconds) prior to the edit-in point to 2 seconds after the edit-out point on a video monitor connected to the recorder.

When the PB/PB/EE selector is set to PB during edit-recording, the simultaneous playback picture can be monitored.

In the insert edit mode, if the tape on the recorder is missing some CTL signals or has a part the servo is unlocked, the playback picture of the tape on the recorder will appear on the monitor and the edit recording is not made during that portion.

### To stop the edit recording

To stop recording before the edit-out point, press the OUT and ENTRY buttons simultaneously.

### Tape protection

If the unit stays in the search still mode for more than 8 minutes, the tape will move in the 1/30 normal speed in forward direction to protect the tape and the video heads, keeping the precise edit-in point.

### To change the preroll time

The preroll time can be changed, if necessary, to 5 seconds. The preroll time set on the recorder will be selected for both the player and recorder. For details, refer to section 2.

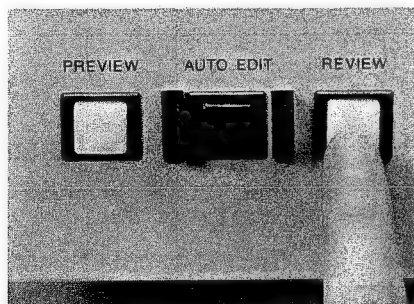
If the color framing mechanism is to be activated, the preroll time should be set to 10 seconds.

### To adjust the edit accuracy

The edit accuracy is preset within  $\pm 1$  frame at the factory. If any adjustment is necessary, refer to section 2 and the following sections.

## 6. TO CHECK THE RECORDING: THE REVIEW MODE

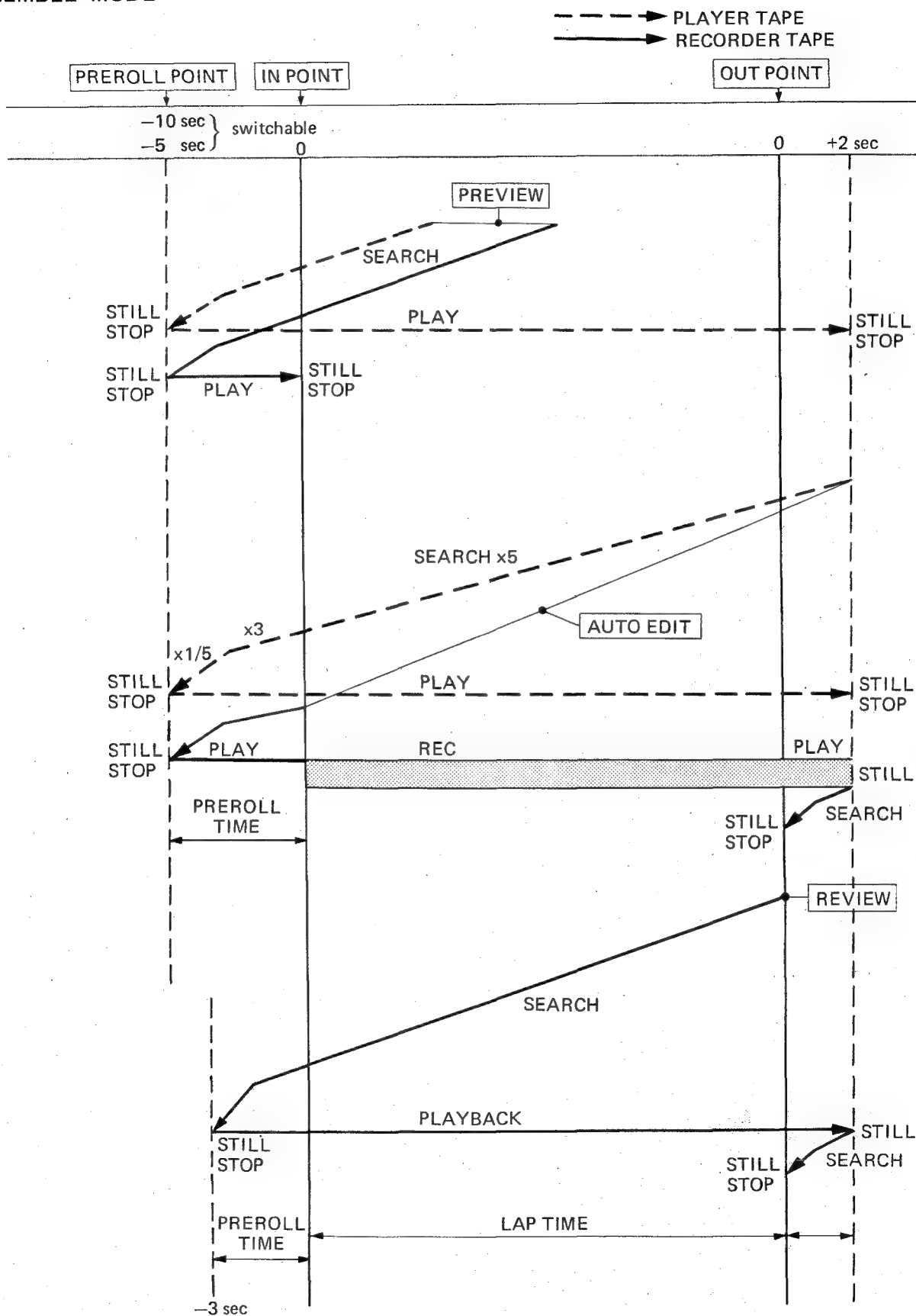
When a scene has been recorded from the edit-in point to the edit-out point, you can check the result by pressing the REVIEW button.



- ① Press the REVIEW button after the recording has been made.  
The REVIEW lamp will light.  
The tape on the recorder only will move.
- ② Watch the recorder's monitor to check the quality of the recording.  
To stop the tape during reviewing, press the STOP button.

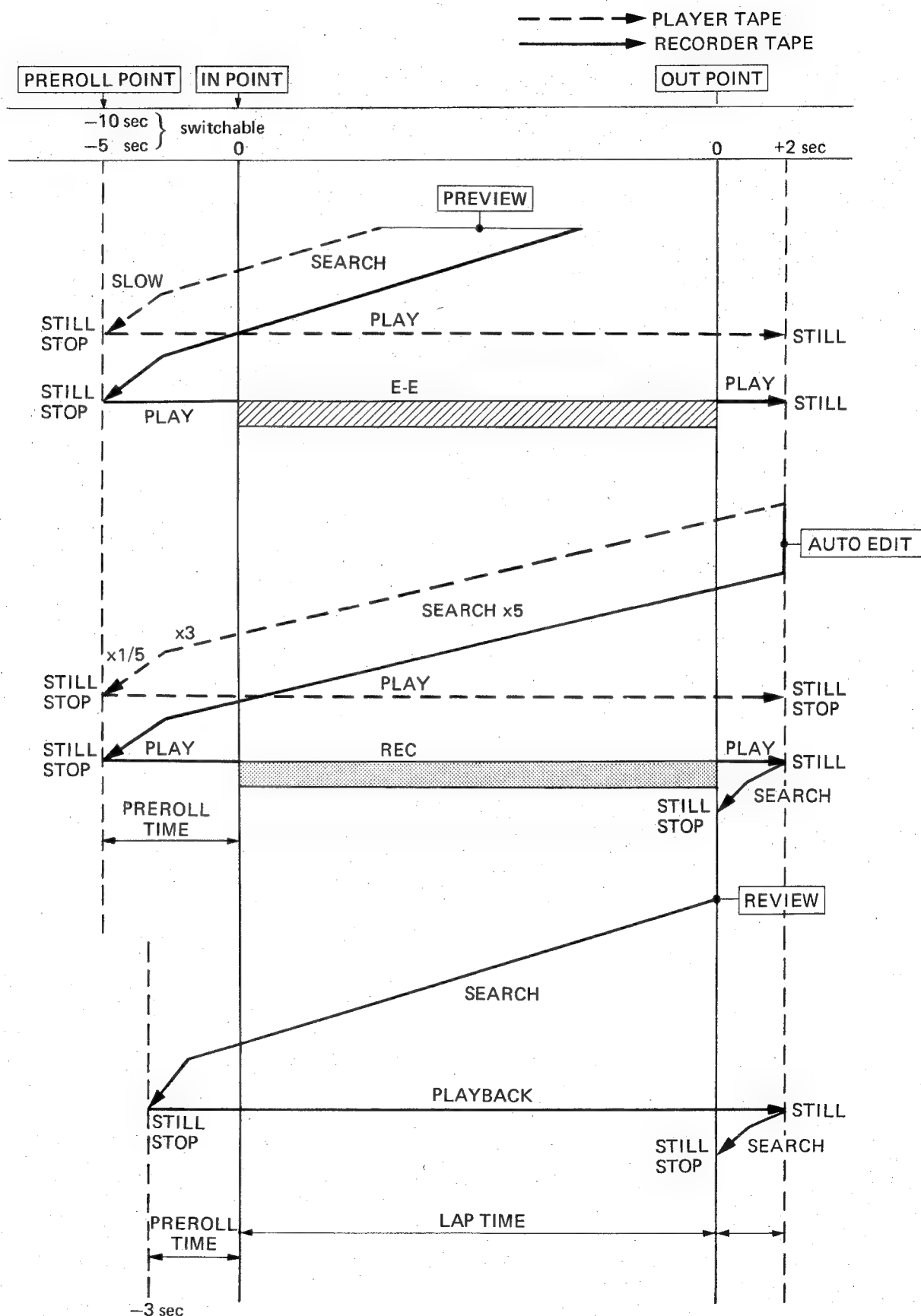


# TAPE MOTION ASSEMBLE MODE





# INSERT MODE





## TIME COUNTER (TAPE TIMER)



The time counter counts the CTL signals on the tape and the displayed figures indicate how much the tape has advanced at normal speed in hours, minutes, seconds and frames. The number changes as the tape moves.

- Counter will not count the time since there is no CTL signal. Therefore, the count display using a non-recorded tape is erroneous.
- When the BK-806 time code generator/reader (optional) is used, the time code is also counted.

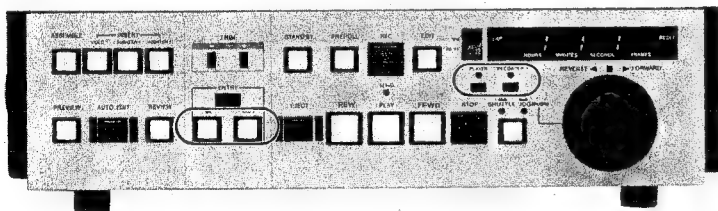
**To set the time counter to "0:00:00:00"**

Press the RESET button.

- When the tape runs in reverse from "0:00:00:00", a minus sign "-" will be displayed to the left of the figures.
- You will find that indexing the contents of your tapes by the figures on the time counter will make searching for editing points much easier.

## To check the edit-in and edit-out points by the time counter

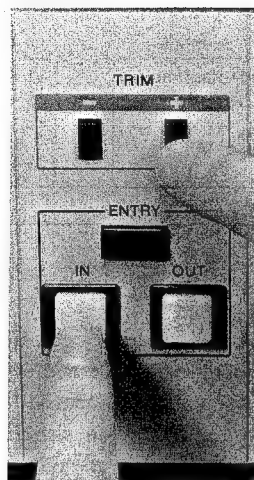
Press the IN or OUT button for the player (Press the PLAYER button.) or for the recorder (Press the RECORDER button.) and hold it down.



While the button is pressed, the figures of the edit-in or the edit-out point of the player or of the recorder will be displayed.



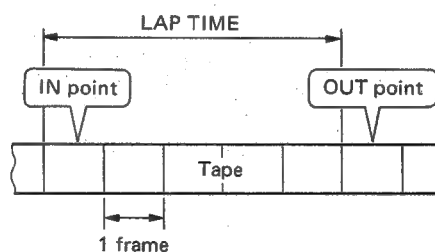
## The TRIM mode: fine adjustment of the editing points using the time counter



- ① Press the IN or OUT button and hold it down through step ②.  
The frame number of the edit-in or edit-out point will be displayed.
- ② Press and release the TRIM + button to advance the editing point one frame or press and release the TRIM – button to set the point back one frame.  
The frame number displayed will change accordingly.  
Repeat pressing and releasing the + or – button until you achieve the desired frame number.

You may also change the edit point by entering another point.

When the lap button is pressed



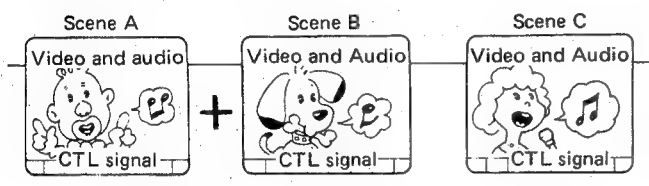
The lap time will be indicated by the time counter.

Editing points entered	The figures displayed indicate
The edit-in and edit-out points have been entered.	The duration of the edit-in and edit-out points.
Only the edit-in point has been entered.	The duration of the edit-in point and the point where the button is pressed.
Only the edit-out point has been entered.	The duration of the previously edited scene.
The edit-in and edit-out points have not been entered.	The duration of the previously edited scene.

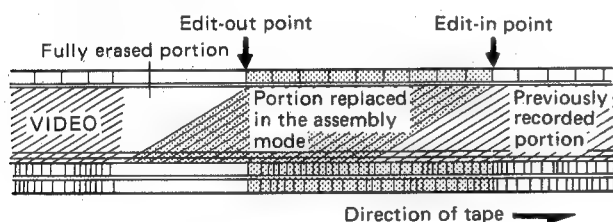


## ASSEMBLY EDITING

In the assembly edit mode, all the signals — video, audio channel 1 and channel 2 and CTL signals — are recorded on the tape simultaneously. First record the video, audio and CTL signals of scene A and then record the video, audio and CTL signals of scene B, scene C, scene D and so on.



The assembly edit mode is used on a non-recorded tape where the video and audios are recorded simultaneously. The recordings are made back to back. If the new material is edited on a previously recorded tape in the assembly mode, the fully erased portion will be produced on the tape after the edit-out point and the picture will be unstable at that point. To add a new material on a previously recorded tape, edit in the insert edit mode.

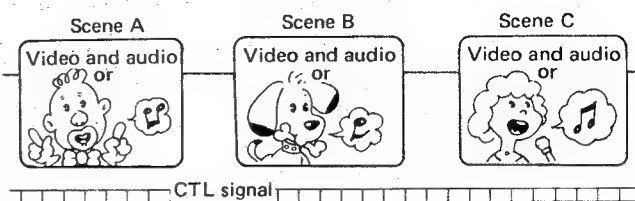


### TO RECORD ON A NEW TAPE IN THE ASSEMBLY MODE

It is not necessary to record the CTL signal in advance, but if the assembly edit is to be made from the beginning to the new tape or after a blank on the tape, a CTL signal has to be recorded for at least 10 seconds (5 seconds, if the preroll time switch is at the OFF position) prior to the first edit-in point. Instead of recording a CTL signal, you may simply duplicate the tape in the record mode.

## INSERT EDITING

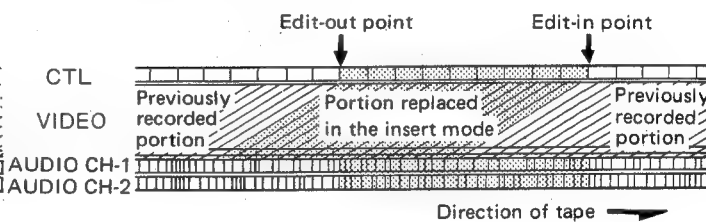
In the insert edit mode, the CTL signal should have already been recorded. New video and/or audio signals are added keyed to this CTL signal.



The insert edit mode is the mode to use when you want—

- to perform accurate edits on a pre-recorded tape.
- to add music and/or narration to a tape on which the video signal has been already recorded.
- to add video signal to a tape on which an audio signal has been already recorded.
- to replace the video and/or audio signals of a tape which has been edited in the assembly mode.

In the insert edit mode, a new scene can be inserted into a previously recorded tape. The picture will be stable at the edit-out point.



### TO RECORD ON A NEW TAPE IN THE INSERT MODE

The CTL signal should be recorded continuously in the portion to be recorded and for at least 10 seconds (5 seconds, if the preroll time switch is at the OFF position) prior to and after that portion.

To record the CTL signal:

- Connect a video camera and continuously record its output signal.
- Connect a standard video signal generator and continuously record its output signal.



## BLINK OF THE LAMPS

Operate the buttons above which the lamps are blinking, and the editing can be completed. The blinking and lighting of lamps are as follows.

- The ASSEMBLE and INSERT (VIDEO, AUDIO CH1, AUDIO CH2) lamps blink indicating that the editing mode is to be determined by pressing the appropriate button.

One or more lamps light indicating that the editing mode has been determined.

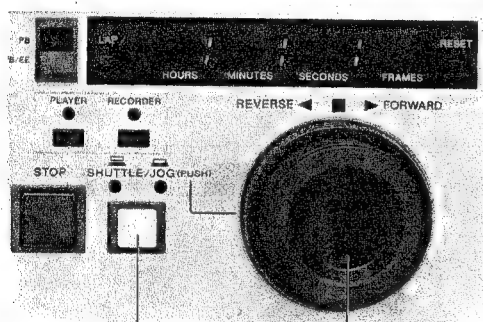
- The IN and/or OUT lamp(s) for the player and recorder blink indicating that the editing point(s) must be entered.

The IN and OUT lamps light when the edit-in and edit-out points have been entered but the editing has not been performed.

- The PREVIEW and AUTO EDIT lamps blink indicating that you can proceed either the preview or auto edit operation.

The PREVIEW or AUTO EDIT lamp lights to indicate that the recorder is in one of these modes.

## HOW TO USE THE SEARCH BUTTON



**Use 1:** to enter the unit directly into the shuttle mode at the speed set on the Search dial.

- 1 Set the Search dial to the desired position to the position for 5 times normal forward speed, for example, in the shuttle mode.
- 2 Press the PLAY button.  
The recorder will enter the playback mode.
- 3 Press the Search button.  
The machine will enter directly into the shuttle mode at 5 times normal forward speed.

**Use 2:** to prevent accidental entry into the search mode

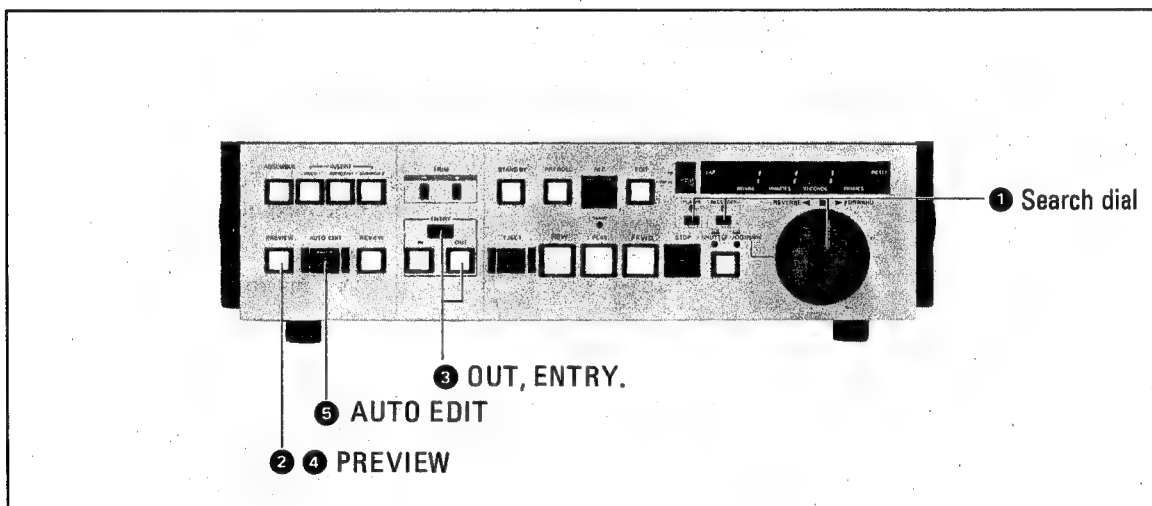
While operating this unit, if the Search dial is touched, the machine will enter the search mode. To prevent this, set the switch S4 on the SY-37 board to OFF. Now the Search dial will not operate until the Search button is pressed. For details, refer to section 2.



## QUICK EDITING

You can save time by entering the edit-in and edit-out points in the preview mode.

- ① Locate the desired edit-in points for the player and the recorder by using the Search dial. Obtain a still picture.
- ② Press the PREVIEW button.  
The points obtained in the step ① will be memorized as the edit-in points for the player and recorder. The preview will start.  
The IN lamps will light.
- ③ Watch the recorder's monitor and at the point where the scene is to end, press the OUT and ENTRY buttons simultaneously on the player or the recorder.  
The counter number will be memorized as the edit-out point.  
The tape will run for 2 more seconds as a post roll and return to the preroll point.
  - You may also use the Search dial to locate the desired point where the scene should end.
- ④ If necessary, preview the tape again.
- ⑤ Press the AUTO EDIT button.  
The edit recording will be made.



## To edit even more quickly

You can edit by skipping the entry procedures.

- ① Locate the edit-in points on the player and the recorder using the Search dial. Obtain a still picture.
- ② Press the AUTO EDIT button.  
Recording will be made from that point which will be the edit-in points on the player and recorder.
- ③ Watch the recorder's monitor and at the point where the scene is to end, press the OUT and ENTRY buttons simultaneously on the recorder or the player.  
The recording will stop at this point, which will be the edit-out point.



## CONTINUOUS EDITING: THE BUTT EDIT

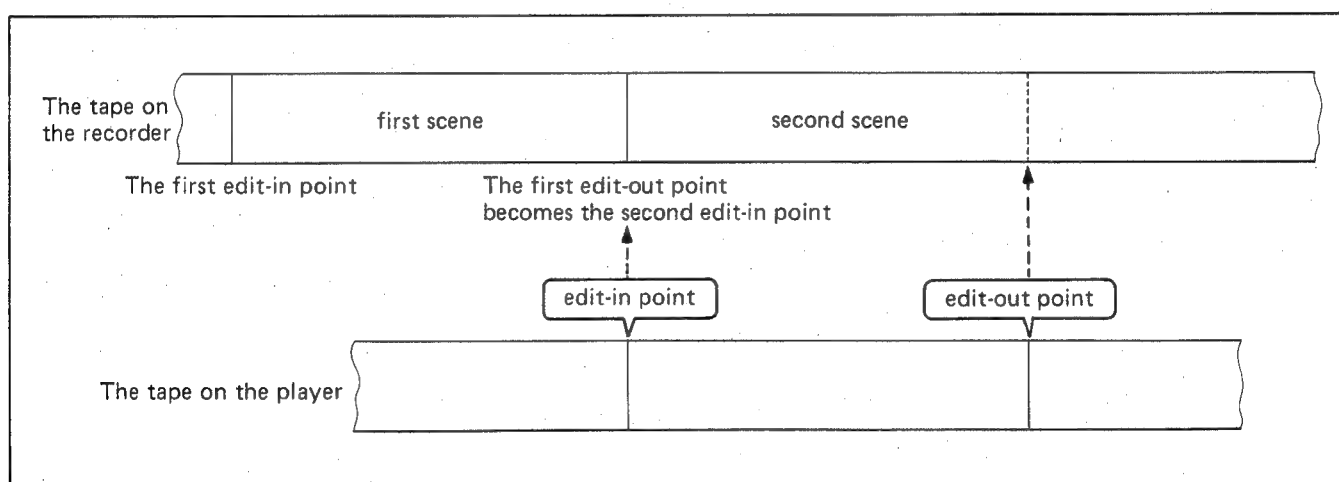
When you have finished recording from edit-in point to edit-out point, the recorder returns to the edit-out point and stops. You can make this edit-out point as the next edit-in point for the recorder.

This technique is called "Butt edit".

- ① Locate the desired positions and enter the next edit-in and edit-out points for the player.
- ② Press the AUTO EDIT button.  
The recording will be performed.

Or you may proceed as follows:

- ① Locate the desired position and enter the next edit-in point for the player.
- ② Press the AUTO EDIT button.  
The recording will start.
- ③ Watch the recorder's monitor and at the point where the scene is to end, press the OUT and ENTRY buttons simultaneously on the recorder or player.  
The recording will stop at this point, which will be the edit-out point.





## THE SPLIT EDIT: TO SET DIFFERENT EDIT-IN OR EDIT-OUT POINT FOR VIDEO AND AUDIO

In the insert edit mode, you can stop the edit-recording of the video and audio channel 1 and audio channel 2 separately.

- ① Select the desired input signal with any or all of the INSERT buttons.
- ② Start automatic edit-recording.
- ③ At the point where the edit-recording of the video or audio is to stop, press the appropriate INSERT button(s).  
The corresponding light(s) will turn off.  
At the point where the edit-recording of the video or audio is to begin, press the appropriate INSERT button(s).  
The corresponding light(s) will turn on.  
You may cut in or cut out the desired signal(s) at any point by pressing the INSERT button(s). Even if all the signals are cut out, the desired signal(s) can be cut in simply by pressing the INSERT button(s).
- ④ When the edit-out point has been entered, the recording will stop automatically. When the edit-out point has not been entered, press the ENTRY and OUT buttons to stop edit-recording.  
Once you stop edit-recording, the video or audio signals cannot be cut in by simply pressing the INSERT buttons.

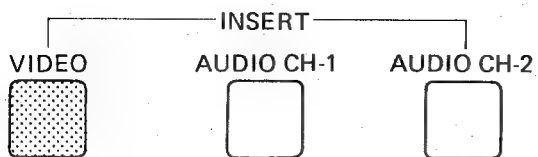
Or in the manual insert edit mode, you can split-edit in the same way. To stop edit-recording, press the PLAY button.



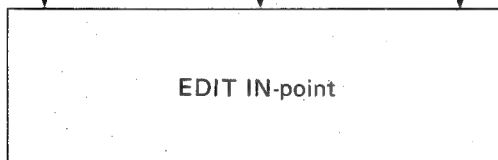
# Example of the split edit



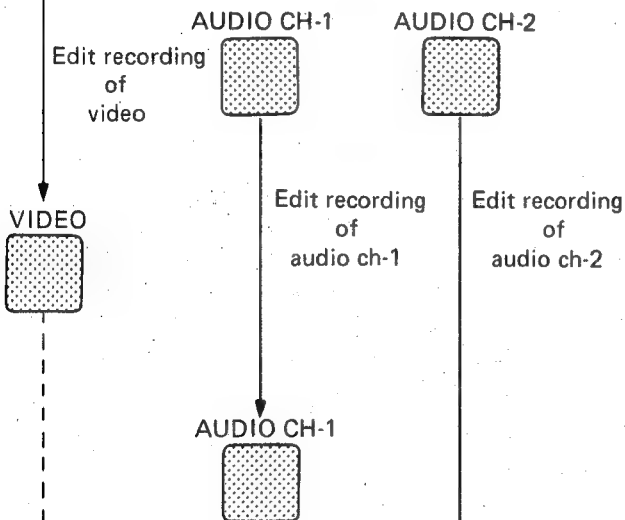
The buttons to be pressed.



The video signal is selected for the input signal.



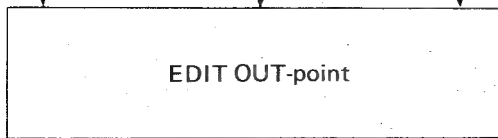
Edit recording of video signal starts by pressing the AUTO EDIT button.



Edit recording of audio ch-1 and ch-2 signal starts.

Recording of the video signal ends.

Recording of the audio ch-1 signal ends.



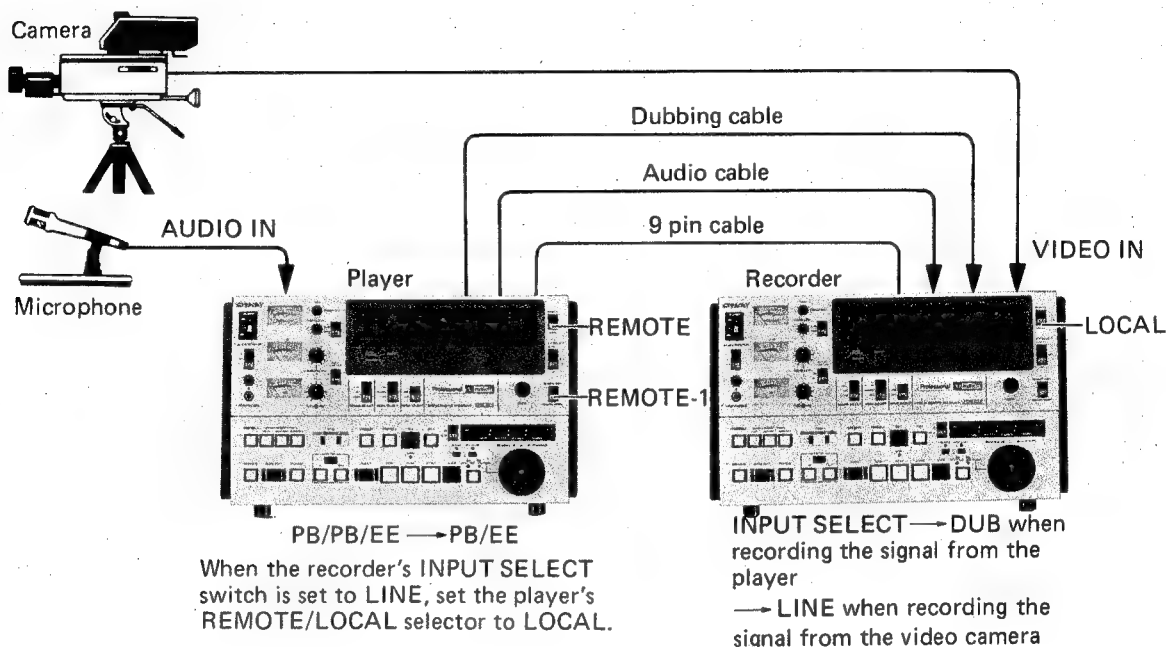
Edit-recording ends.



## EDITING THE SIGNAL FROM A VIDEO CAMERA: THE LIVE EDIT

### Connections

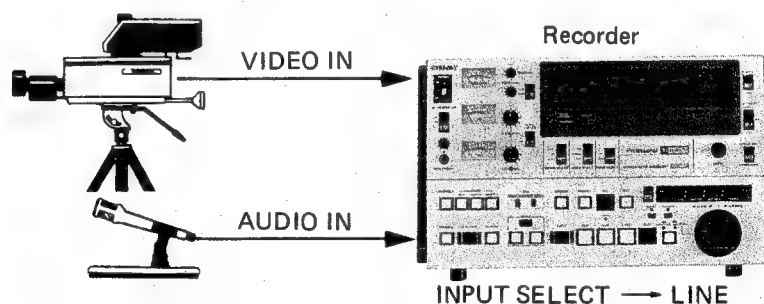
To record while editing using a signal from a video camera and signal from a player:  
Make connections as shown in the illustration.



- While recording the signal from the camera, set the player in the stop mode.

To record a signal from a video camera only:

Connect a video camera to the VIDEO IN connector of the recorder. Set the INPUT SELECT switch of the recorder to LINE.



### Operation

- Select the editing mode: assembly or insert.

#### Assembly editing

- Enter only the edit-in point of the recorder and start the recording of the camera signal with the AUTO EDIT button.
- At the point where the camera recording is to end, press the ENTRY and OUT buttons simultaneously.

#### Insert editing

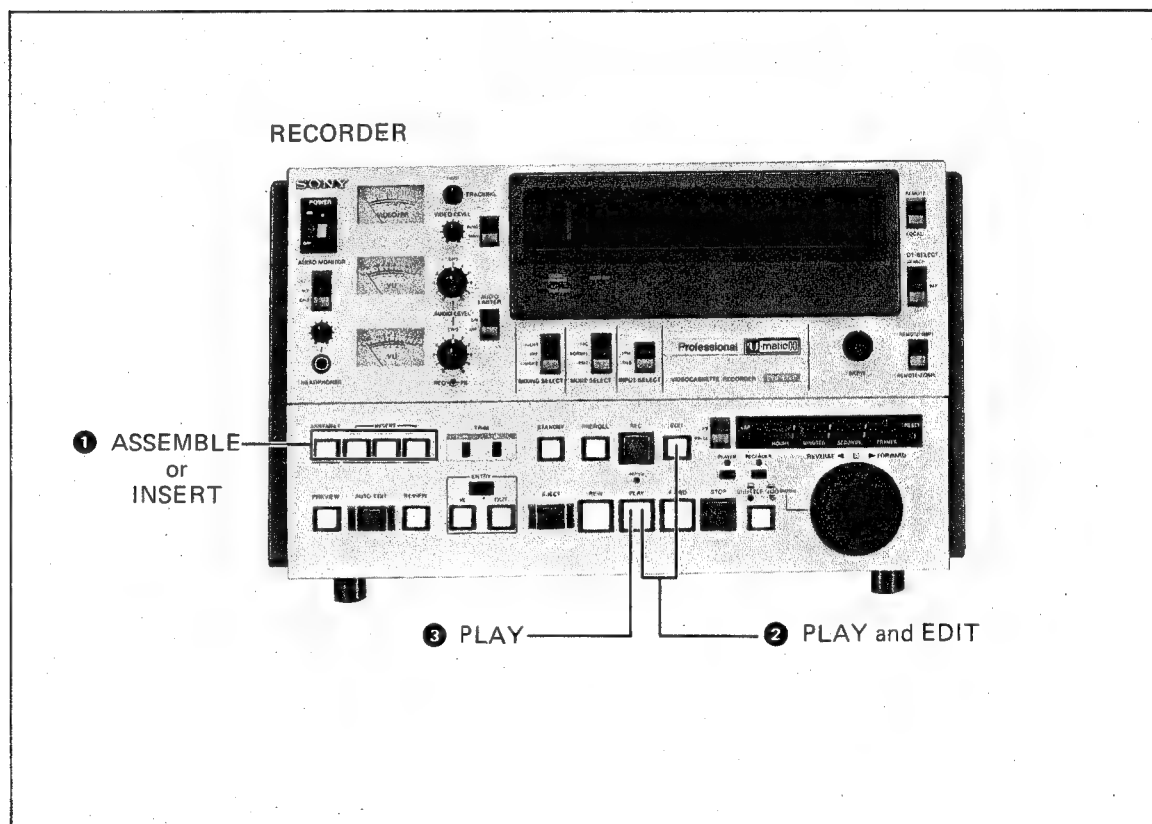
- Enter the edit-in and edit-out points of the recorder and start the recording of the camera signal with the AUTO EDIT button.  
You may also start recording with only the edit-in point entered and stop the recording by pressing the ENTRY and OUT buttons simultaneously.
- When assembly editing, the edit-out point cannot be entered on the recorder.



## MANUAL EDITING

## Operation

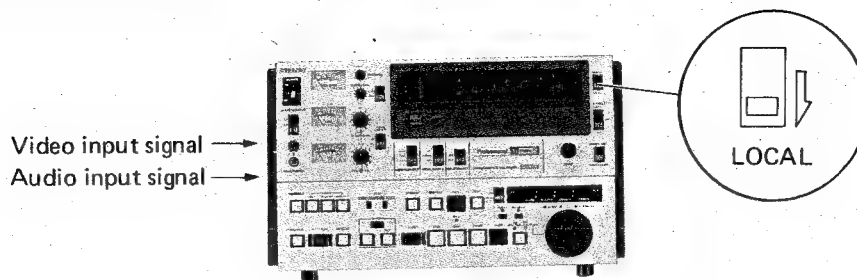
- ❶ Select the editing mode: assembly or insert.
- ❷ During the playback of both the recorder and player, at the point where the scene is to begin, simultaneously press the PLAY and EDIT buttons on the recorder.  
Recording will begin at the point the buttons have been pressed.
- ❸ At the point where the scene is to end, press the PLAY button on the recorder.  
The edit recording will stop and the playback will begin on the recorder.  
To stop the tape, press the STOP button.



- If the editing is started from the stop mode or if the editing is ended with the STOP button, the picture will be unstable at the edit-in or edit-out point.
- To obtain a perfectly stable playback picture, start the playback at least 10 seconds prior to the edit-in point.
- When the PB/PB/EE switch is set to PB during edit-recording, the simultaneous playback picture can be monitored.
- To see the dynamic-tracking playback picture on the player, carefully read the notes on pages 1-21 and 1-22.



## 1-6-2. Editing Using One BVU-820P Videocassette Recorder



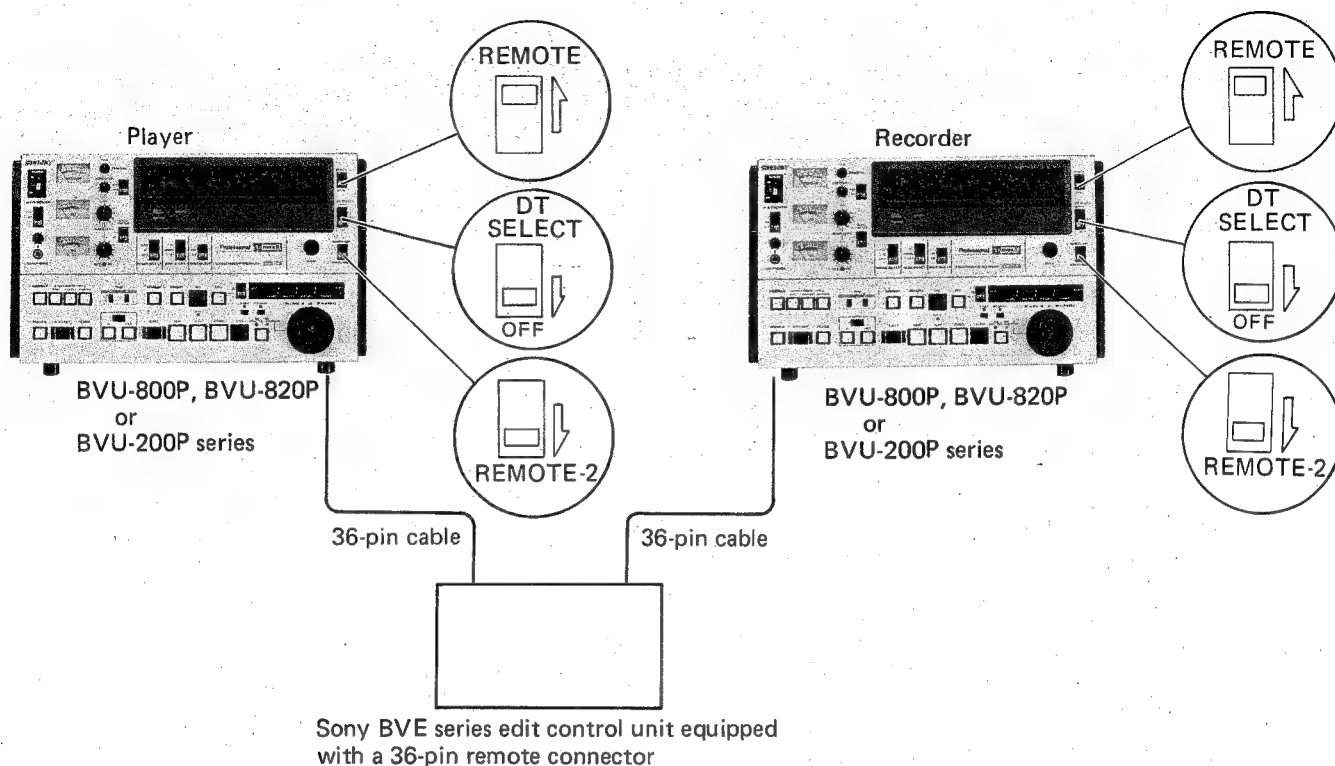
With this machine, if you connect a video and audio input signal, editing can be made as described on the previous pages.

### Notes:

- Set the REMOTE/LOCAL switch to LOCAL
- The entry of the edit-in and edit-out points, AUTO EDIT, PREVIEW, TRIM can be proceeded with this machine. Operate the input video and audio signal source separately.



### 1-6-3. Editing with a Conventional Control Unit



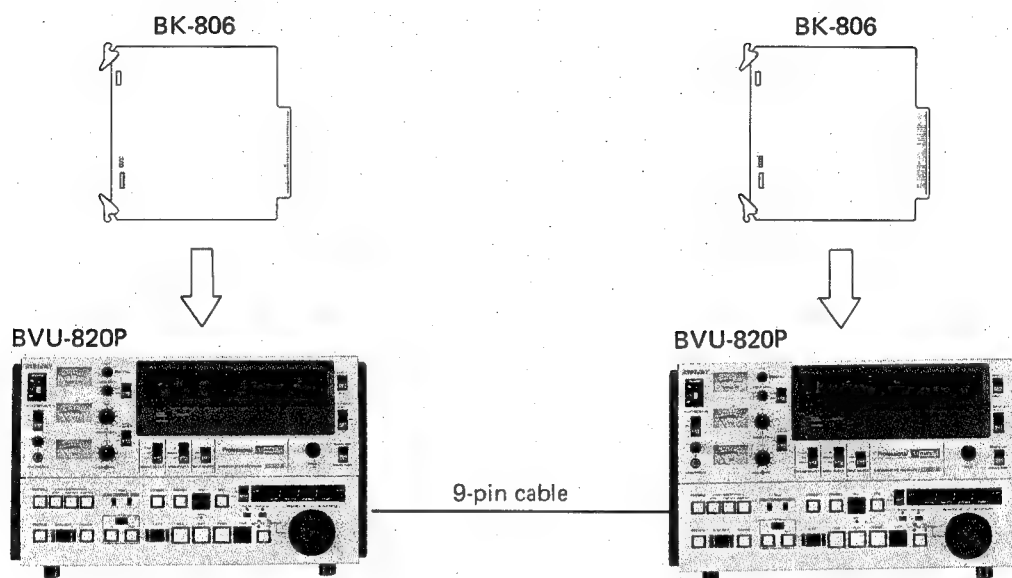
Use the function buttons on the control unit to remotely control the player and the recorder.

- Set the REMOTE/LOCAL switch to REMOTE if it is equipped.
- Set the REMOTE-1/REMOTE-2 switch to REMOTE-2.
- To remove the cassette in the machine, set the REMOTE/LOCAL switch to LOCAL and then press the EJECT button.  
To operate the machine, with the control unit, return the switch to the REMOTE position.
- The tape speed controlled with the BVE-500 series' search dial is as follows: If the DT SELECT switch is set to SEARCH or OFF, the tape speed at x2 position will be x5 and at x1/20 position will be x1/30, and if the DT SELECT switch is set to VAR, the tape speed at x-2 position will be x-1 and at x+2 position will be x+3. When the editing is performed, be sure to set the DT SELECT switch to OFF.
- When changing the mode of the BVU-820P from the search mode using a button on the BVE-500 series, be sure to keep the button pressed until the machine is set in your desired mode.
- When the buttons on the BVE-500 series are pressed, the appropriate lamps on the BVU-820P may not light. The lamps on the BVE-500 series indicate the correct operating mode of the player and recorder.
- When the BVU-820P is used as a recorder and the BVE-500 series unit is connected, set the COLOR FRAMING switch on the recorder to OFF.
- When the search dial on the connected BVE-500ACE or the BVR-510ACE is set to PAUSE, the guardband noise may appear on a still picture even in the dynamic tracking playback mode. To avoid the noise, modification on the BVE-500ACE or the BVR-510ACE is required. For details, please refer to your Sony personnel.



#### 1-6-4. Time Code Editing

##### USING TWO BVU-820P VIDEO CASSETTE RECORDERS



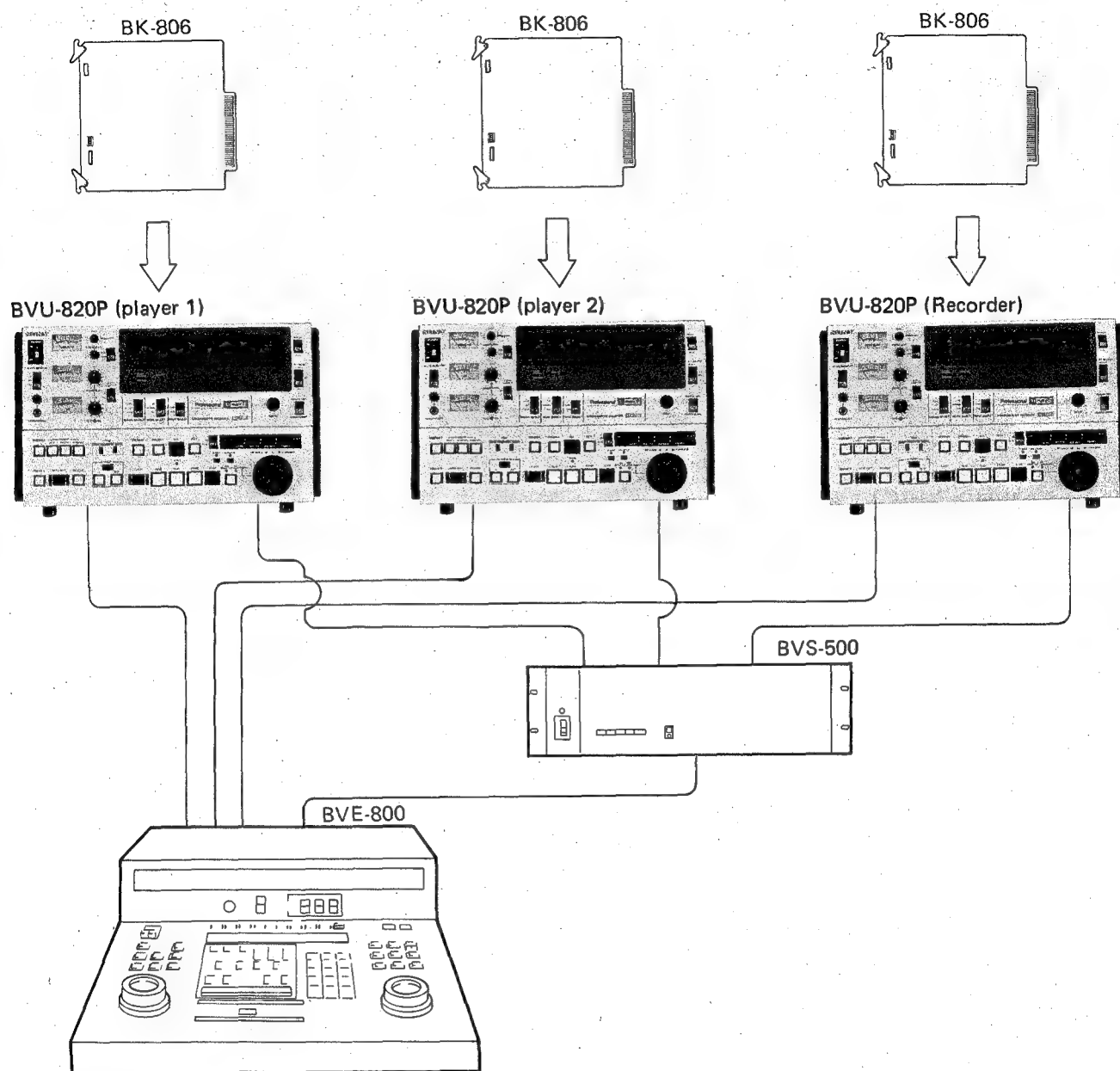
The recording and playback of time code and the time code editing will be possible when the BK-806 time code generator/reader is inserted into the BVU-820P instead of the TC-13 circuit board.

The input and output connections of the time code is not required for editing.

For details, refer to the instruction manual furnished with the BK-806.



## USING THE BVE-800 AND THE BVS-500



When the BVE-800 automatic editing control unit and the BVS-500 video and audio switcher are used together, the following operation will be possible.

- A/B roll editing (Three VTRs are controlled)
- Automatic split editing
- Auto-editing using the multievent memory
- Auto-search
- Tape punching of edit lists with the TTY
- Program length calculation
- Cue tone recording and playback
- Recording of slow and still picture (The playback picture should be connected using the TBC.)

For details, refer to the instruction manual furnished with the BVE-800 and BVS-500.



## 1-7. TAPE PROTECTION

In order to prevent any damage to the tape, the machine automatically goes into reset mode, when something wrong happens during operation.

For example;

— Fast forward/rewind/forward/reverse/stop/still mode:

When irregular reel rotation or tape tension is detected, system control forces machine to STOP or EJECT, then after 3 seconds, if irregular reel rotation or tape tension is still detected, reel motor power will turn off and mechanical brake is applied simultaneously.

— During threading/unthreading:

When irregular reel rotation or tape tension is detected, system control forces machine to STOP or EJECT.

— Irregular voltage, Sensor LED damage:

When irregular voltage at B + power line or sensor LED damage (no light) is detected, system control forces machine to STOP or EJECT, then mechanical brake is applied.

## 1-8. CLEANING THE HEAD

A KC-1C cleaning cassette (optional) is used to clean the video and audio heads. The tape is threaded into the unit in the same way as the video cassette.

- 1) Insert the cleaning cassette and press the **PLAY** button at once.
  - 2) Run the tape for about 10 seconds.
  - 3) Eject the cassette at once.
- Because the head rotates even in the stop mode, leaving the cassette in the machine cause the head worn out.
  - To clean the head without using the KC-1C cleaning cassette, refer to Section 2 and follows.



## 1-9. CHECK ROUTINES

To check that all functions of the BVU-820P are operating properly, execute the following routines.

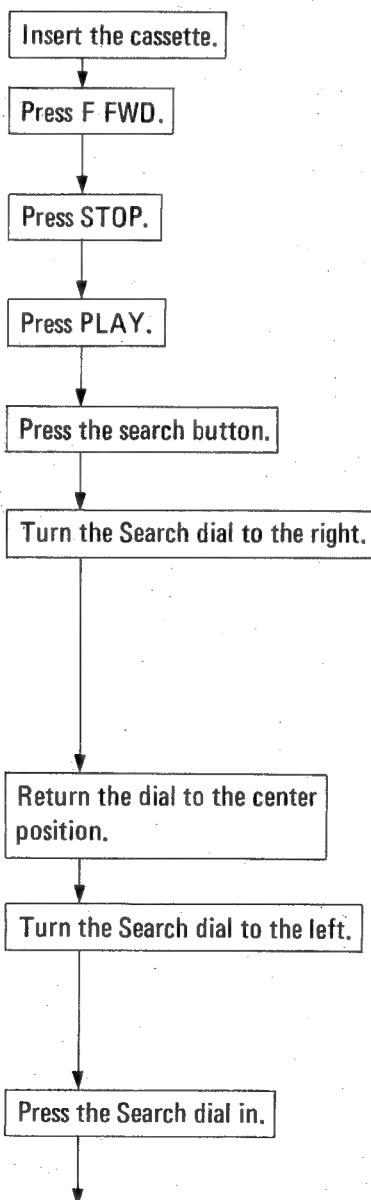
### To check playback functions

First, connect a video and audio monitor and prepare a videocassette tape on which video signals and audio CH-1 and CH-2 signals are recorded.

With switches set to

POWER : ON  
REMOTE/LOCAL : LOCAL  
PB/PB/EE : PB  
AUDIO MONITOR: MIX  
DT SELECT : OFF

Action



Check that

The playback picture of high speed appears and the video and audio are not muted.

A still picture appears.

The playback picture appears. Audio CH-1 and CH-2 are heard.

The search lamp lights.

The playback speed changes from low to high. When the dial is turned to the position at which a click is felt, the machine enters into the fast forward mode (×10). (When the machine enters into the fast forward mode, the pinch roller is released and the picture is stopped or distorted for a moment.)

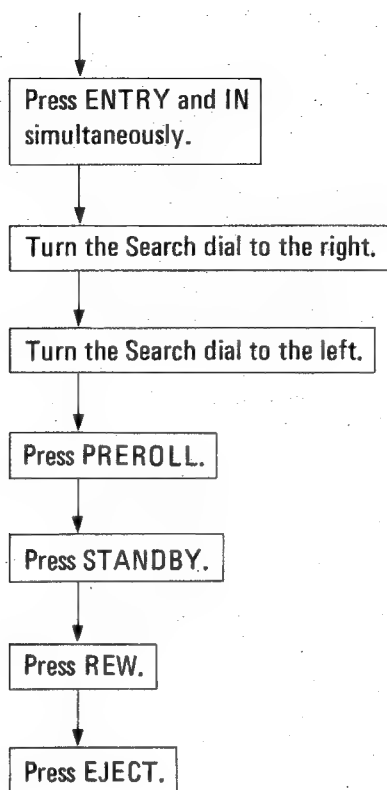
The SHUTTLE lamp lights.

The still picture appears.

The reverse playback picture appears. The speed changes from low to high. When the dial is turned to the position at which a click is felt, the machine enters into the rewind mode (×10).

The still picture appears.  
The JOG lamp lights.





IN lamp lights.  
Note the counter number of the point (edit-in).

The forward playback picture in the jog mode appears.

The reverse playback picture in the jog mode appears.

The tape runs to a point 10 seconds prior to the edit-in point and stops. A still picture appears.

STANDBY lamp goes off.

The tape rewinds. The E-to-E mode picture appears. At the beginning of the tape, the tape stops automatically.

The cassette is ejected.

PB/PB/EE

: PB/EE



## To check dynamic-tracking playback functions

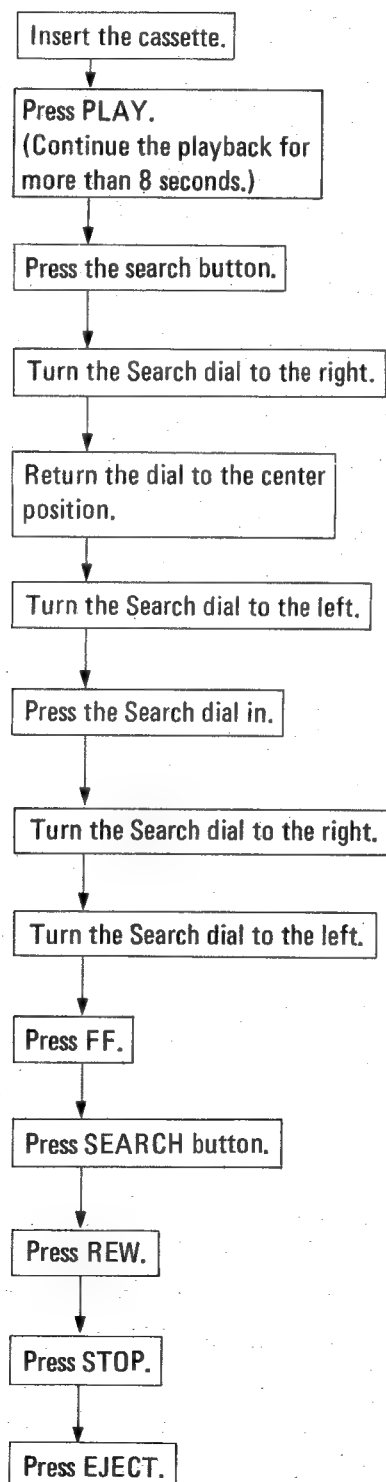
First, connect a video and audio monitor and prepare a videocassette tape on which video signals and audio CH-1 and CH-2 signals are recorded.

- Be sure to use the time base corrector.

With switches set to

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : VAR  
 MODE SELECT : TBC

Action



Check that

The playback picture appears. Audio CH-1 and CH-2 are heard.

The search lamp lights.

The noiseless forward picture appears in the SHUTTLE mode.

The noiseless still picture appears.

The noiseless reverse picture appears in the SHUTTLE mode.

The noiseless still picture appears in the JOG mode.

The noiseless forward picture appears in the JOG mode.

The noiseless reverse picture appears in the JOG mode.

The noiseless still picture appears.

The still picture with noise appears.

The cassette is ejected.



## To check recording functions

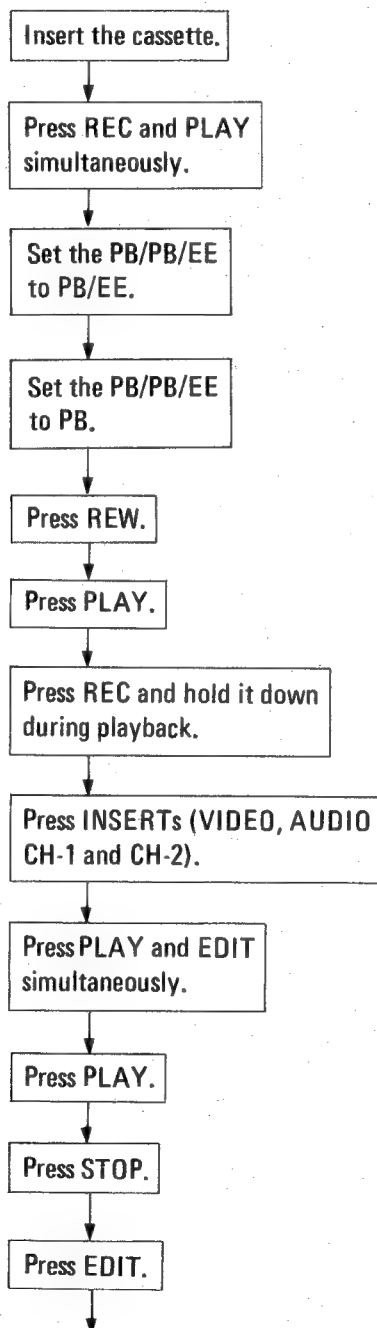
First,

- Prepare a videocassette tape on which recording can be made.
- Connect signals to the VIDEO IN, AUDIO IN CH-1 and CH-2 connectors.
- Connect a video and audio monitor.

With switches set to

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 INPUT SELECT : LINE  
 PB/PB/EE : PB  
 AUDIO MONITOR: MIX  
 DT SELECT : OFF

### Action



### Check that

The recording begins.

E-to-E mode picture appears.

Simultaneous playback picture appears.

The tape rewinds.  
 Rewind the tape to the beginning of recording and stop the tape.

Playback of the recorded scene appears. The audio CH-1 and CH-2 are heard.

E-to-E mode picture appears while the REC is pressed.

The VIDEO, AUDIO CH-1 and AUDIO CH-2 lamps light.

The manual edit recording will begin.

The edit recording will stop, but the tape will continue to run in the playback mode.

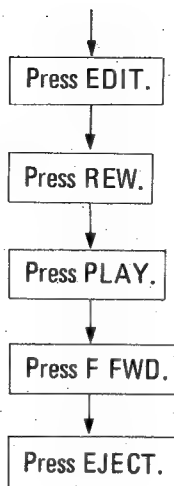
Still picture of the tape appears.

The E-to-E mode picture and sound selected by the INSERT buttons appear.



PB/PB/EE

:PB/EE



The E-to-E mode picture and sound disappear and the still picture of the tape appears.

The tape rewinds.  
Rewind the tape to the beginning of edit-recording and stop the tape.

Playback of the edit-recorded scene appears. The audio CH-1 and CH-2 is heard.

The tape advances rapidly and stops at the end of the tape. Then the tape rewinds automatically and stops at the beginning.

The cassette is ejected.



To check editing functions

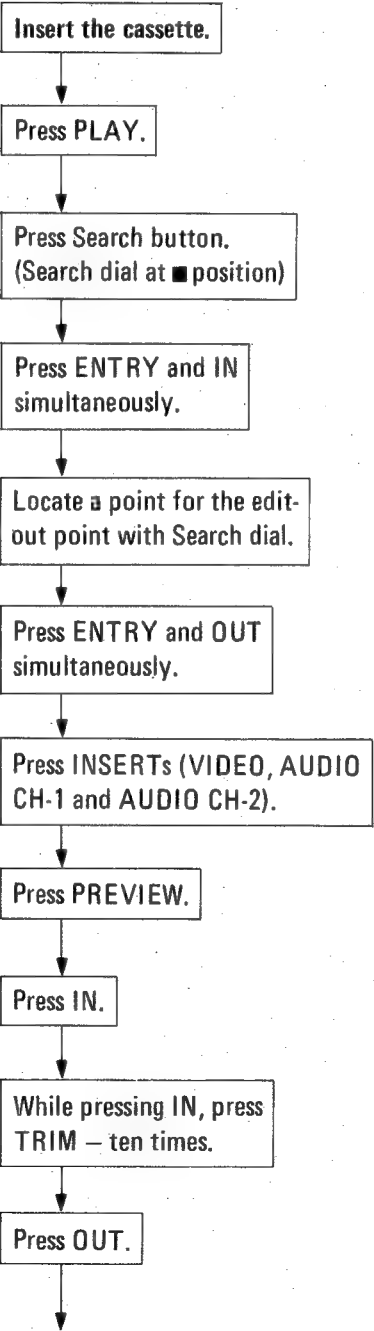
First,

- Prepare a tape on which video, audio CH-1 and audio CH-2 are recorded.
- Connect signals to the VIDEO IN and AUDIO IN connectors.
- Connect a video and audio monitor.

With switches set to

POWER : ON  
REMOTE/LOCAL : LOCAL  
AUDIO MONITOR: MIX  
DT SELECT : OFF

Action



Check that

Playback picture appears.

The still picture appears.

Note the counter number of the point (edit-in).

Note the counter number of the point (edit-out).

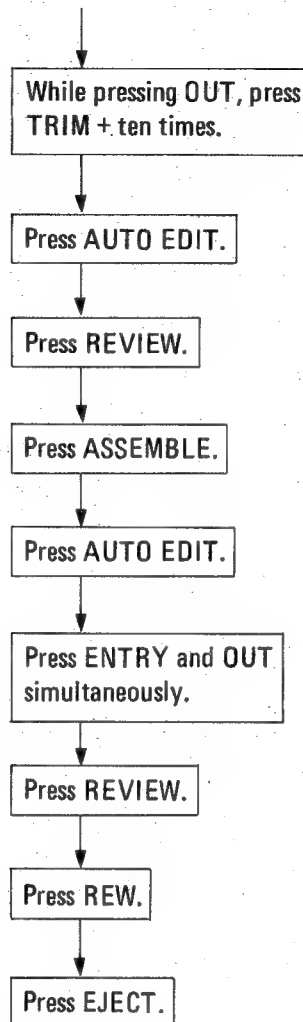
Previewing proceeds.

The counter number of the edit-in point is displayed.

The counter number decreases by ten frames.

The counter number of the edit-out point is displayed.





The counter number increases by ten frames.

Auto edit recording proceeds.

The reviewing of the edit recorded scene proceeds.

The ASSEMBLE button lights.

The point where the AUTO EDIT has been pressed is entered as the edit-in point and auto edit recording begins.

The point is entered as the edit-out point and auto edit recording stops.

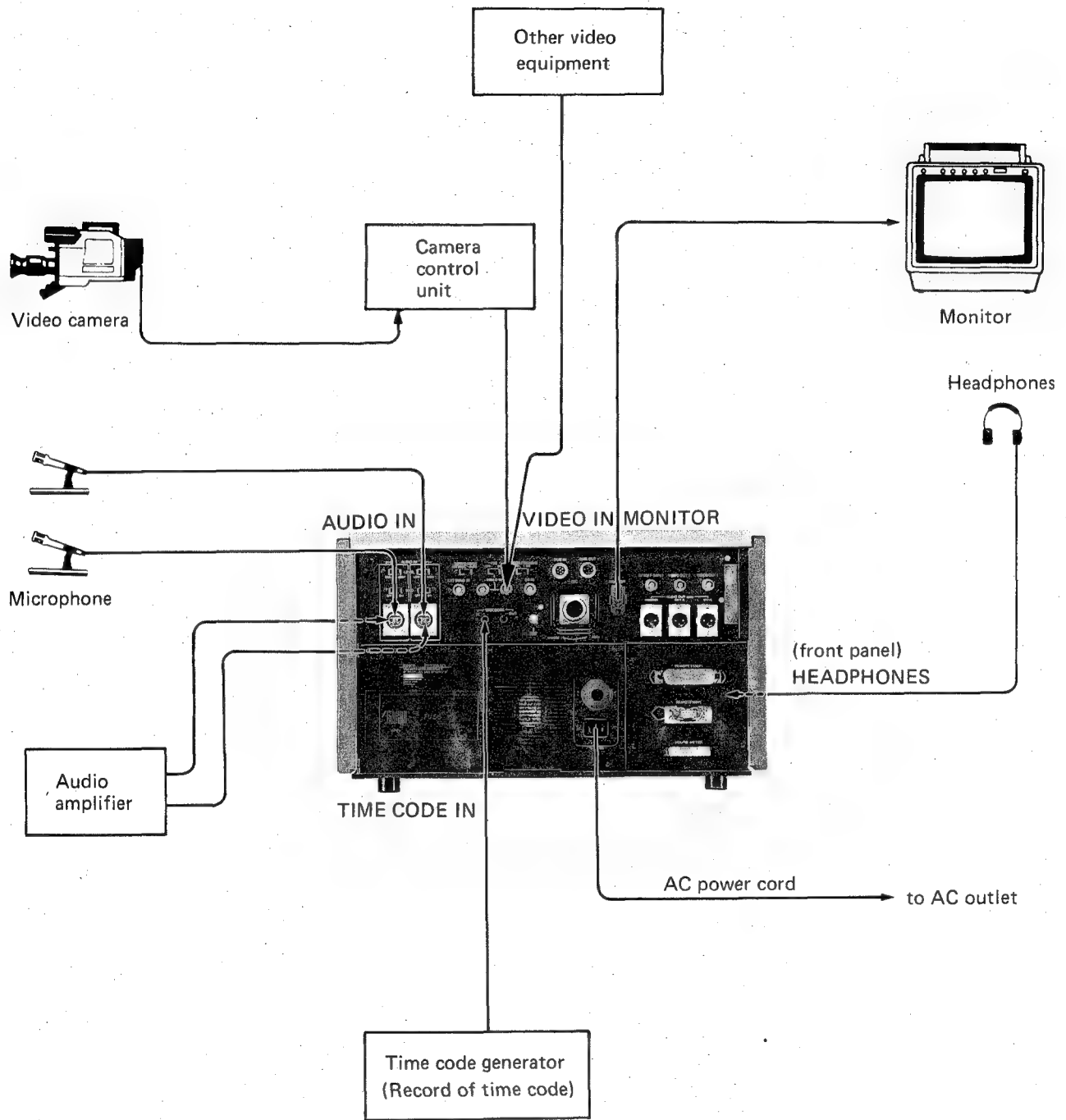
The reviewing of the edit recorded scene is proceeded.

The tape stops at the beginning.

The cassette is ejected.



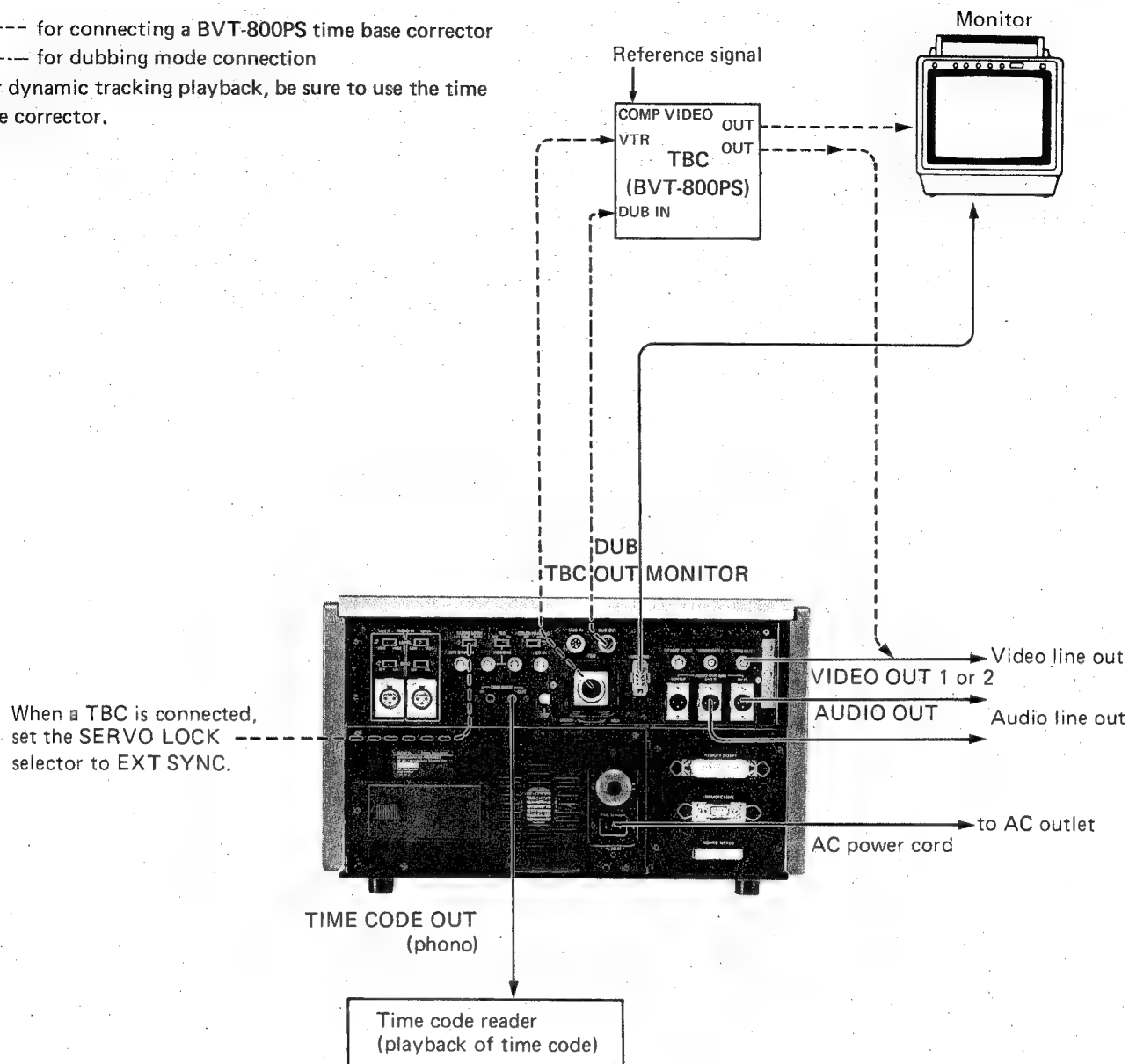
# 1-10. CONNECTIONS RECORDING



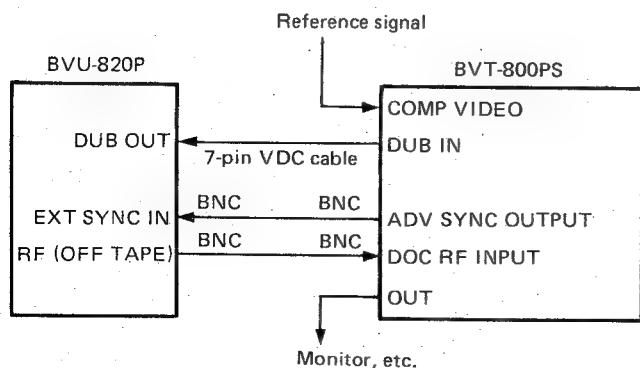


## PLAYBACK

----- for connecting a BVT-800PS time base corrector  
 ----- for dubbing mode connection  
 For dynamic tracking playback, be sure to use the time base corrector.



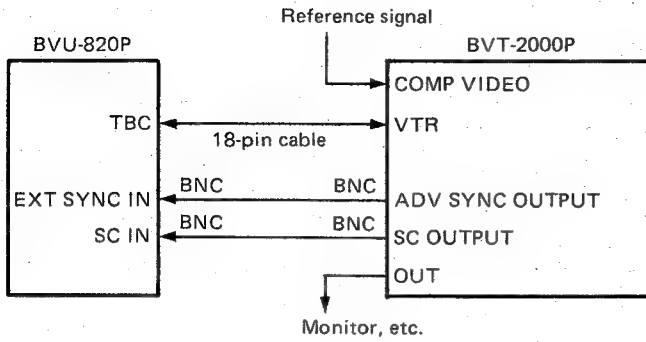
The BVT-800PS can be connected without using a 18-pin cable as follows.



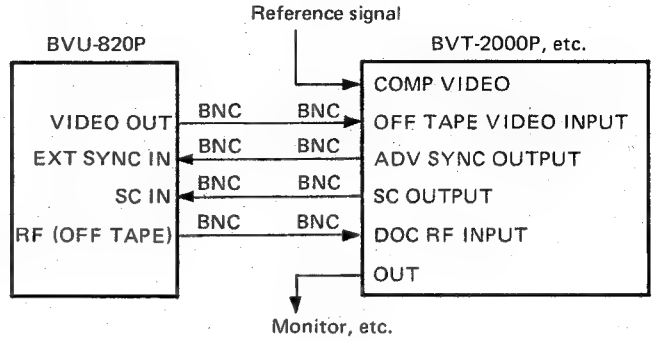


When a time base corrector other than BVT-800PS is used, connect it as follows.

- To connect a BVT-2000P using a 18-pin cable



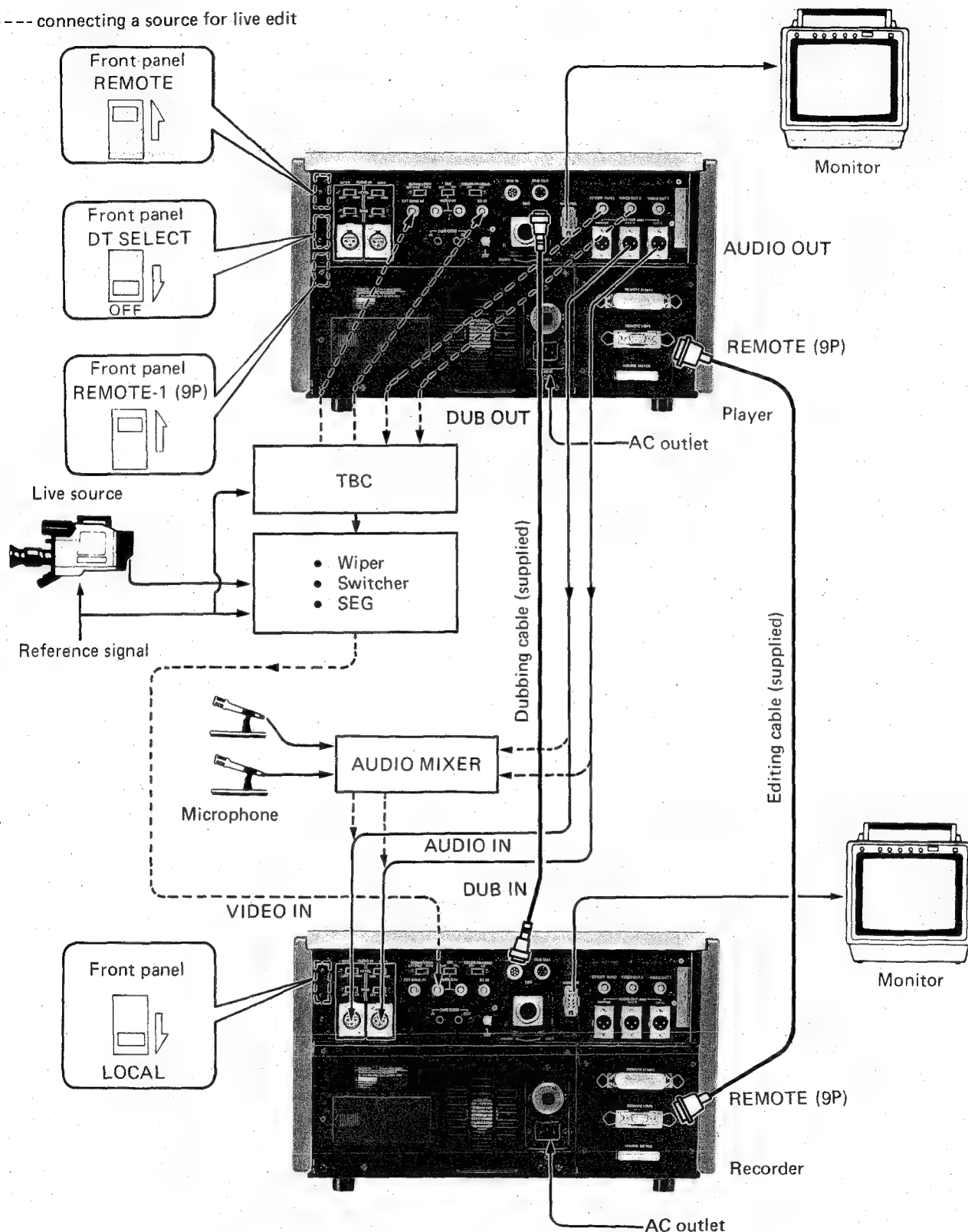
- To connect a time base corrector without using a 18-pin cable





# EDITING – Editing with two BVU-820Ps –

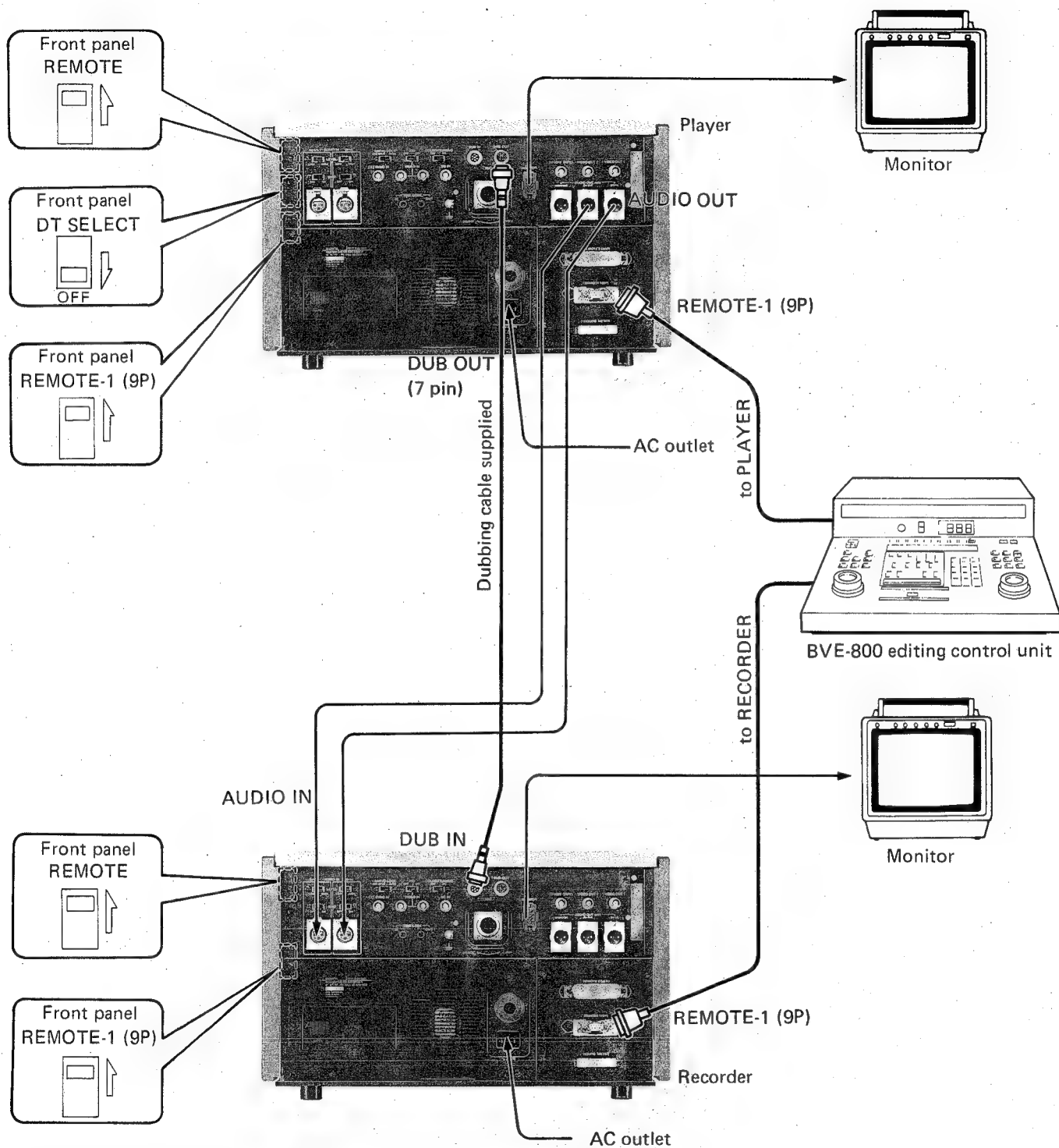
----- connecting a source for live edit



- Do not make simultaneous (parallel) connections with the DUB IN connector on the player and DUB OUT connector on the recorder.



# EDITING – Editing with a control unit –



- Do not make simultaneous (parallel) connections with the DUB IN connector on the player and the DUB OUT connector on the recorder.
- For the live source connection, refer to the previous pages.
- The videocassette recorder with 36 pin or 9 pin connector can be connected other than the BVU-820P, but the function is limited according to the function of the machine.
- To use the BVE-500ACE, BVE-1000 or BVE-5000P editing control unit, refer to the instruction manual furnished with the equipment.



## 1-11. SPECIFICATIONS

## MECHANICAL

Weight	38 kg (83 lb 12 oz)
Dimensions	454 x 283 x 550 mm (17 <sup>7</sup> / <sub>8</sub> x 11 <sup>1</sup> / <sub>4</sub> x 21 <sup>3</sup> / <sub>4</sub> inches) (w/h/d)
Operating position	Horizontal
Tape transport mechanism	U-matic system (3/4-inch KCA, KCS cassettes)
Tape speed	9.53 cm/s
Wow/flutter	±0.25% (DIN)
Record/playback time	60 min. maximum with KCA-60 videocassette
Fast forward time	Less than 4 min. with KCA-60 videocassette
Rewind time	Less than 2.5 min with KCA-60 videocassette
Search speed	SHUTTLE: DT SELECT switch → SEARCH, OFF Still, 1/30, 1/10, 1/5, 1/2, 1, 2, 5 and 10 times normal in forward and reverse direction (Noiseless playback is possible.) DT SELECT switch → VAR 1 time in reverse direction to 3 times in forward direction (Noiseless playback) JOG: Still to 1 in forward and reverse direction (Noiseless playback is possible.)

## Connectors

AC IN	3-pin AC connector
VIDEO IN x2	BNC connectors
VIDEO OUT x2	BNC connectors
AUDIO IN CH-1/L, CH-2/R	XLR female connectors
AUDIO OUT CH-1/L, CH-2/R	XLR male connectors
AUDIO OUT MONITOR	XLR male connectors
TIME CODE IN	RCA phono jack
TIME CODE OUT	RCA phono jack
DUB IN	7-pin male connector
DUB OUT	7-pin female connector
SC IN	BNC connector
EXT SYNC IN	BNC connector
RF (OFF TAPE)	BNC connector
TBC	CCY connector
MONITOR OUT	8-pin connector
REMOTE (36-p)	36-pin connector
REMT0E (9-p)	RS-422 9-pin connector
HEADPHONES	JM-60 headphones binaural jack

Operating temperature

+5°C to +40°C

Storage temperature

-20°C to +60°C

## ELECTRICAL

Power requirements	AC 100/120/220/240 V ±10% (Selectable), 48 to 64 Hz
Power consumption	170W
Editing functions	ASSEMBLE and INSERT (VIDEO, AUDIO CH-1, AUDIO CH-2), AUTO EDIT, MANUAL EDIT PREVIEW, REVIEW, PREROLL, TRIM

## VIDEO

Video recording system	Luminance: FM Chroma: SC low-range conversion
Input	PAL composite video, sync negative 1.0 Vp-p <sup>+1.0</sup> / <sub>-0.5</sub> V, 75Ω, unbalanced
Output	PAL composite video, sync negative 1.0 Vp-p ± 0.2 V, 75Ω, unbalanced
Dubbing input	Luminance signal: 0.5 Vp-p Sync negative, Impedance: 75Ω ± 10% Chroma signal: 0.5 Vp-p Impedance: 75Ω ± 10%
Dubbing output	Luminance signal: 0.5 Vp-p Sync negative Impedance: 75Ω ± 10% Chroma signal: 0.5 Vp-p Impedance: 75Ω ± 10%
Horizontal resolution	370 lines (monochrome mode) 260 lines (color mode)
Signal to noise ratio	More than 46 dB (monochrome mode) More than 46 dB (color mode)

## AUDIO

Input (MIC)	-60 dB, 3 k-ohms, balanced (matches 600-ohm microphones)
(LINE)	+4 dB, 10 k-ohms/600 ohms, balanced
Output (LINE)	+4 dB, low impedance, balanced (600-ohm load permissible).
(HEADPHONES)	-46 to -26 dB, 8 ohms load, binaural
(MONITOR)	+4 dB, 600-ohm load, balanced
Distortion	Less than 2.0% (1 kHz reference level)
Frequency response	50 Hz to 15 kHz
Signal to noise ratio	48 dB (at 3% distortion level)
TIME CODE input	0 dB ± 6 dB, 10 k-ohms, unbalanced (0 dB = 1.55 Vp-p pulse)
TIME CODE output	0 dB ± 3 dB, low impedance, unbalanced (0 dB = 1.55 Vp-p pulse)



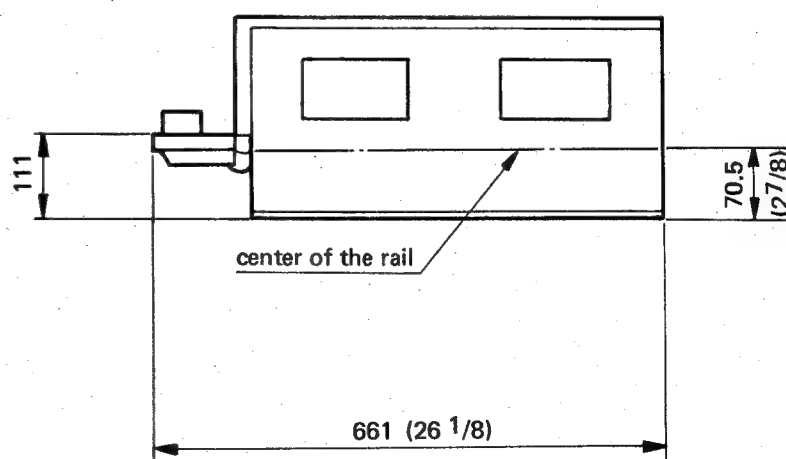
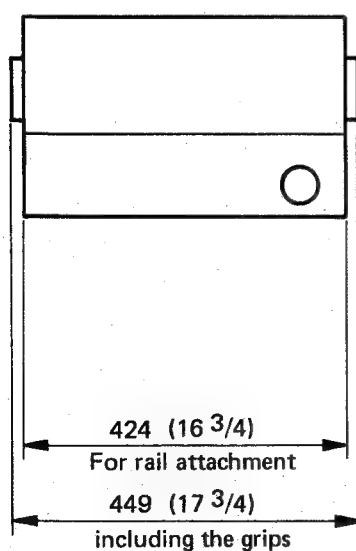
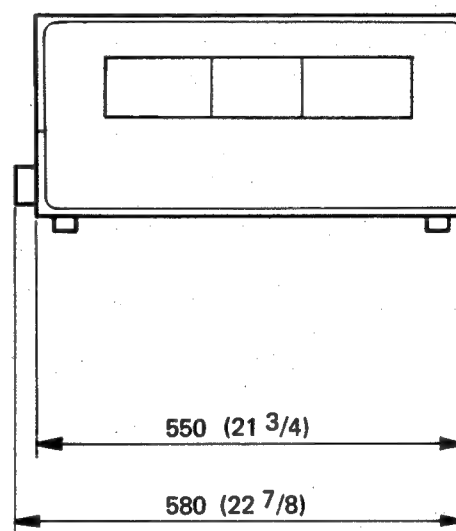
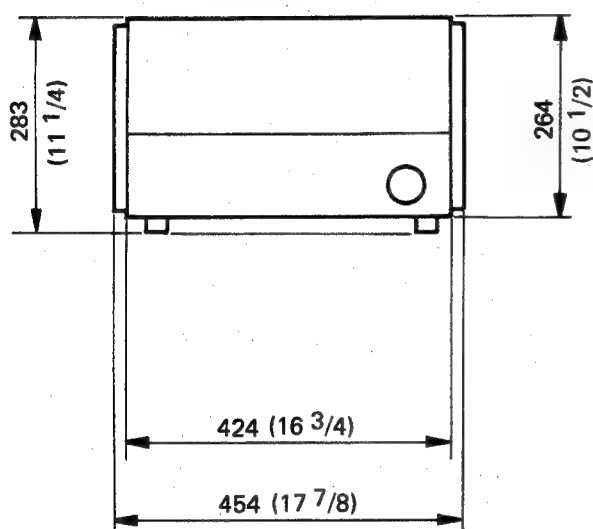
SC input	2 Vp-p $\pm$ 1V, 75 ohms, unbalanced
SYNC input	0.2 Vp-p to 5 Vp-p, negative, 75 ohms, unbalanced (1 Vp-p $\pm$ 0.2 V with VIDEO input)
RF output (OFF TAPE)	0.5 Vp-p $\pm$ 0.1 V, 75 ohms, unbalanced

Design and specifications subject to change without notice.

**Accessories supplied**

AC power cord . . . . .	1
Dubbing cable VDC-5 (5 m) . . . . .	1
Remote control cable (9 pin-9 pin) RCC-5G . . . . .	1
Extension board EX-7 . . . . .	1
Operation and maintenance manual . . . . .	1

**VIEW OF EXTERIOR**



UNIT: mm (inch)



# TEIL 1

## BETRIEB

### 1-1. BESONDERE MERKMALE

#### Schnelles Auffinden der Schnittpunkte

Ein Suchlauf, bei dem das Wiedergabebild erkennbar ist, erlaubt ein schnelles Auffinden der Schnittpunkte. Der Suchlauf ist auf 2 Arten durchführbar: Beim Shuttle-Betrieb ist die Wiedergabegeschwindigkeit von 1/30 bis zum 10 fachen Wert der Normalgeschwindigkeit in beiden Richtungen variierbar; im Jog-Betrieb bewegt sich das Bild analog der Drehung des Suchlauf-Knopfes. Auch beim Schnellvorlauf- und Rücklaufbetrieb bleibt das Band um die Kopftrommel geschlungen, und bei Verwendung eines Time-Base-Correctors erhält man ein erkennbares Bild.

#### Schnittbetrieb

Bei Anfügschnitten werden der Videokanal sowie die Tonkanäle 1 und 2 gleichzeitig geschnitten. Bei Einfügschnitten können Videokanal, Tonkanal 1 und Tonkanal 2 unabhängig voneinander geschnitten werden. Das Schnittmaterial kann vor und nach dem Aufnehmen betrachtet werden.

#### Bedienung an der Vorderseite

Alle Bedienungsfunktionen, einschließlich Einlegen und Herausnehmen der Cassette, können am vorne angebrachten Bedienungs-pult vorgenommen werden. Das Bedienungs-pult kann für individuelle Bedienbarkeit in 6 Stufen bis maximal 90° verdreht werden.

#### Fernbedienung

Werden für den Schnittbetrieb zwei BVU-820P Video-Cassettenrecorder verwendet, so kann die Wiedergabemaschine von den Bedienungselementen der Aufnahmemaschine aus fernbedient werden. Das Bedienungs-pult kann abgenommen werden.

#### Zeitcode-Aufnahme/Wiedergabe

Das Gerät besitzt eine getrennte Adreßspur, so daß der EBU-Zeitcode aufgezeichnet und wiedergegeben werden kann, wenn ein Zeitcode-Generator und ein Auswerter angeschlossen ist. Es braucht dazu keine Tonspur aufgegeben zu werden.

#### $\phi^2$ -Servoregelkreis

Auch an einer Schnittstelle werden Bildstörungen (kurzzeitiges Kippen des Bildes) vermieden, da der BVU-820P eine H-Phasenkorrektur- und eine Bildfangeinrichtung besitzt. Die H-Phasenkorrektur arbeitet automatisch.

#### Antriebswellen-Servo

Der BVU-820P besitzt eine Antriebswellen-Servoschaltung, die von einem externen Signal gesteuert wird.

#### Halbbildgenauarbeitender Servo

Dieses System erkennt die geraden und ungeraden Halbbilder in einem Vollbild und sorgt für einen exakten Schnitt zwischen dem Ende eines geraden Halbbildes und dem Anfang des nächsten ungeraden Halbbildes.

#### Halbbildrichtige Farbträgerverkopplung

Der BVU-820P besitzt einen Schaltkreis für halbbildrichtige Farbträgerverkopplung, der alle vier Halbbilder erkennt und sie so ausrichtet, daß am Schnittpunkt keine Farbblitze entstehen.

#### Direktantrieb mit sechs Gleichstrommotoren

Der BVU-820P besitzt sechs getrennt angebrachte Motoren. Die Kopftrommel wird von einem bürstenlosen Gleichstrommotor direkt angetrieben. Zum Antrieb der Antriebswelle dient ebenfalls ein bürstenloser Gleichstrommotor, der für diesen Zweck neu entwickelt wurde. Da die Abwickelspule und die Aufwickelspule von getrennten Motoren angetrieben werden, kann der Bandzug von einem Servosystem genau geregelt werden. Dies ermöglicht einen schnellen Zugriff zu einer bestimmten Bandstelle.

#### Wiedergabe mit dynamischer Spurlage (Dynamic Tracking\*)

Im Wiedergabebild sind bei Standbild-, Jog- und Shuttle-Betrieb mit -1 facher bis +3 facher Normalgeschwindigkeit keine Spurrasen-Störungen zu sehen.

\* „Dynamic Tracking“ ist ein Warenzeichen der Sony Corporation.

#### Video-Monitor-Funktion

Das Aufnahmebild kann während des Aufnahme- oder Schnittbetriebs gleichzeitig wiedergegeben werden.

#### Digitaler Zeitzähler

Der Zeitzähler zeigt bei Normalgeschwindigkeit die bereits verbrauchte Bandmenge in Stunden, Minuten, Sekunden und Einzelbildern an. Zu diesem Zweck werden die CTL-Signale gezählt. Es kann auch die Schnittzeit angezeigt werden.

#### Automatisches oder manuelles Video-Aufnahmesystem

Der Video-Aufnahmepegel kann entweder automatisch oder manuell eingestellt werden.

#### Tonsignal-System

Die beiden Tonsignal-Aufnahme- bzw. Wiedergabepegel können getrennt eingestellt werden. Falls erforderlich kann ein Begrenzer aktiviert werden, um auch bei plötzlich auftretenden starken Pegelspitzen des Eingangssignals eine verzerrungsfreie Aufnahme sicherzustellen. Die Signale von Tonkanal 1 und Tonkanal 2 können beim Aufnehmen auch gemischt werden.



### Schnitt/Kopieranschlüsse

Beim Kopieren der Videosignale über die DUB IN- und DUB OUT-Anschlüsse kommt es auch nach etlichen Wiederholvorgängen nur zu einer äußerst geringen Qualitätseinbuße.

### Anschluß eines Time-Base-Correctors

Der BVU-820P besitzt einen Eingang für ein externes Hilfsträgersignals (SC IN) und einen Eingang für ein externes Synchronisationssignal (EXT SYNC IN), so daß ein Time-Base-Corrector angeschlossen werden kann. Außerdem ist ein HF-Ausgang (RF OUT) vorgesehen, an den ein Dropout-Compensator (BVT-2000P etc.) angeschlossen werden kann.

### Automatischer Bandrücklauf und automatischer Bandstop am Ende

Ist das Band bis zum Ende durchgelaufen, so wird es automatisch zum Anfang zurückgespult und dort automatisch gestoppt.

### Kontrolllampen

Diese Lampen sind gut erkennbar auf der Vorderseite angebracht und zeigen dem Operator die Funktion des farbträgerverkoppelten Halbbild-Servosystems, der Synchronisation, eine eventuelle Kondenswasserbildung im Geräteinneren, die Zeitkode-Aufnahme/Wiedergabe sowie den Betrieb des Antriebswellen- und Kopftrommel-Servosystems an.

### Einsteckbare Platinen und Module

Bei der Entwicklung der einsteckbaren Platinen und Moduln wurde großen Wert auf Service- und Wartungsfreundlichkeit gelegt. Sie sind leicht durch Abnehmen der oberen Geräteabdeckung zugänglich.

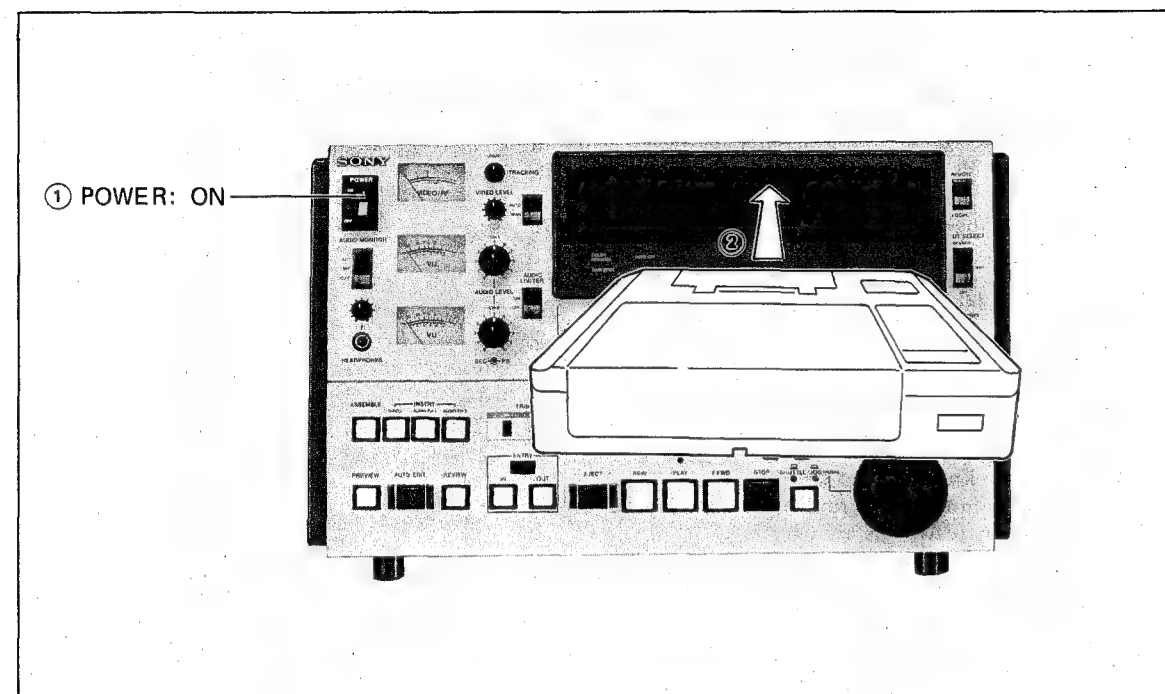
### Einbaumöglichkeit in ein 19-Zoll Normgestell

Der BVU-820P kann in ein 19-Zoll EIA-Normgestell eingebaut werden.



## 1-2. EINLEGEN UND HERAUSNEHMEN EINER CASSETTE

### EINLEGEN EINER CASSETTE

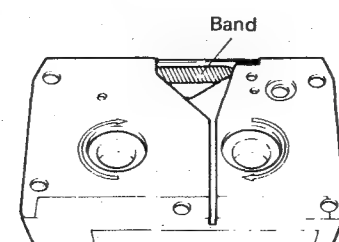


- Das Band fädelt sich automatisch ein, die Kopftrommel beginnt sich zu drehen, und auf dem Bildschirm erscheint ein Standbild.

### HERAUSNEHMEN EINER CASSETTE

Drücken Sie die EJECT-Taste bei eingeschaltetem Netzschalter.

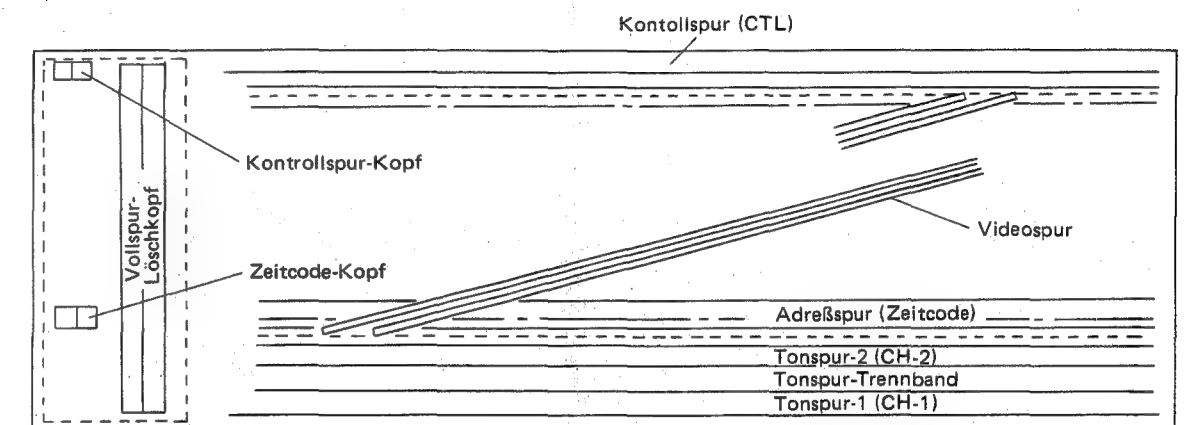
- Hinweise:**
- Verwenden Sie in diesem Gerät nur Sony U-matic Videocassetten oder die entsprechenden Typen KCA-60 (60 Minuten) oder KCS-20 (20 Minuten).
  - Nehmen Sie nach der Verwendung die Cassette heraus, bevor Sie das Gerät abschalten.  
Wurde der Netzschalter trotz eingelegter Cassette ausgeschaltet, so schalten Sie ihn wieder ein. Die EJECT-Lampe leuchtet dann kurzzeitig auf, und anschließend leuchten die STANDBY- und die STOP-Lampe. Drücken Sie zum Herausnehmen der Cassette die EJECT-Taste, sobald die STOP-Lampe aufleuchtet.
  - Wird ein zu weit aufgespultes Band eingefädelt, so sorgt ein Sensor automatisch für ein schnelles Rück- bzw. Vorspulen, um die Kopfspitze vor Beschädigungen durch das Vorspannband zu bewahren. Wird eine KCA-Cassette mit versehentlich herausgezogenem endseitigen Vorspannband eingelegt, so wird die Cassette automatisch wieder ausgeworfen. Drehen Sie in diesem Fall die Abwickelspule manuell, bis das endseitige Vorspannband ganz aufgewickelt ist, und legen Sie die Cassette dann wieder ein.



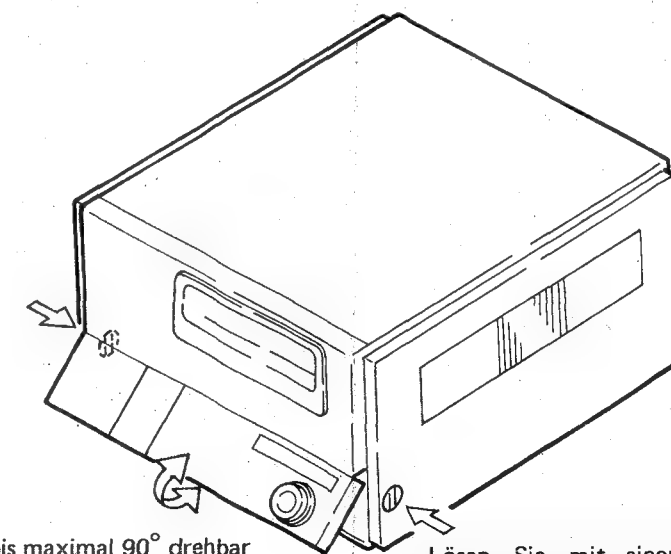
### Schutz eines bespielten Bandes vor versehentlichem Löschen

Entfernen Sie die kleine rote Kappe an der Unterseite der Cassette; das Gerät kann dann nicht in die Aufnahmefunktion übergehen. Setzen Sie die Kappe wieder ein, wenn die Cassette wieder für Aufnahmen herangezogen werden soll. Lassen Sie die Kappe normalerweise eingesetzt.

- Die Abbildung unten zeigt das von diesem Gerät erzeugte Aufnahmespurmuster bei Verwendung eines Zeitcode-Generators.



### AUSRICHTUNG DES BEDIENTUNGSPULTES



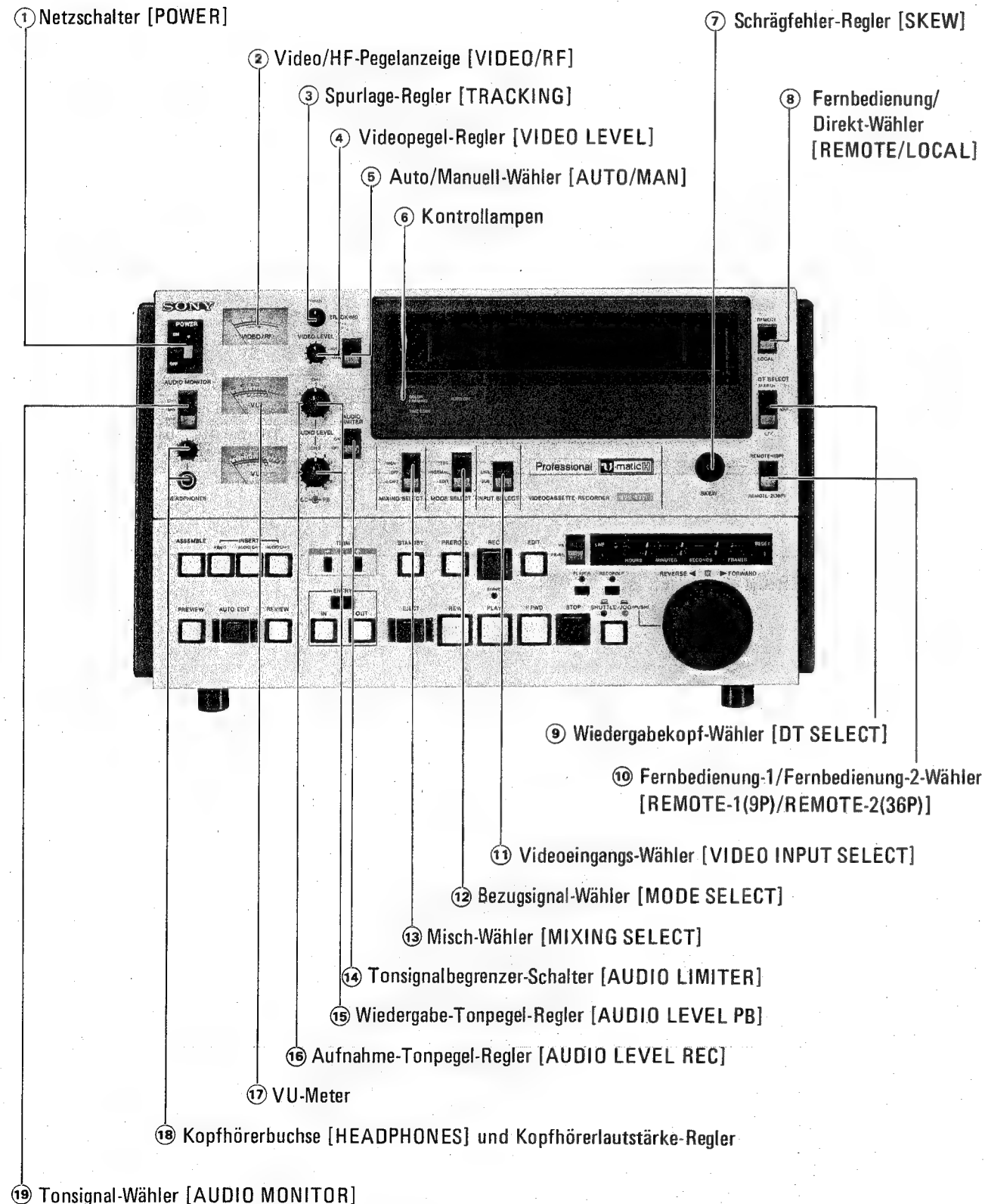
Lösen Sie mit einem Schraubenzieher die beiden seitlich angebrachten Arretierschrauben.

- Das Bedienungspult kann abgenommen, und sämtliche Funktionen können über Kabel fernbedient werden. Genauere Informationen dazu finden Sie im Teil 2.



### 1-3. LAGE UND FUNKTION DER BEDIENUNGSELEMENTE

#### VORDERSEITE



#### 1 Netzschalter [POWER]

Stellen Sie diesen Schalter zum Einschalten des Geräts auf ON. Die Anzeigen leuchten auf, und der Zähler zeigt 0:00:00:00 an.

#### 2 Video/HF-Pegelanzeige [VIDEO/RF]

Diese Anzeige zeigt den Videoeingangspegel während Aufnahme-, gleichzeitigem Wiedergabe- und E-zu-E-Betrieb an. Bei Wiedergabe zeigt die Anzeige das aufgezeichnete FM-Signal (Trackingpegel) an.

#### 3 Spurlage-Regler [TRACKING]

Mit diesem Regler kann beim Wiedergeben des Bandes die Spurlage eingestellt werden. Steht der DT SELECT-Schalter (9) auf OFF, so wird die Spurlage des R/P (record/playback)-Kopfes eingestellt, steht er auf SEARCH oder VAR, so wird die Spurlage des DT (dynamic tracking)-Kopfes eingestellt. Stellen Sie den Regler normalerweise in die mit FIXED gekennzeichnete Mittelstellung. Ist das Wiedergabebild verrauscht, so drehen Sie diesen Regler nach links oder rechts, bis die VIDEO/RF-Anzeige (2) maximalen Wert anzeigt. Stellen Sie den Regler nach dem Abspielen des verrauschten Bandes wieder in die Stellung FIXED. Stellen Sie den Regler bei Aufnahme immer in die Stellung FIXED. Wird der Regler während der Aufnahme gedreht, so ist das spätere Wiedergabebild an dieser Stelle instabil.

#### 4, 5 Videopegel-Regler und Auto/Manuell-Schalter [VIDEO LEVEL und AUTO/MAN]

**AUTO:** Der Synchronsignal AGC Schaltkreis wird aktiviert und stellt den Videoeingangspegel automatisch ein. Der Synchronsignal AGC Schaltkreis verwertet zur automatischen PegelEinstellung den Synchronsignal-Eingangspegel.

**MAN:** Der Videoeingangspegel kann während des E-zu-E-Aufnahmebetriebs manuell eingestellt werden. Stellen Sie dazu den VIDEO LEVEL-Regler so ein, daß sich der Zeiger der VIDEO/RF-Anzeige (2) im blauen Bereich befindet.

#### 6 Kontrollampen

**FRAMING:** Diese Lampe leuchtet auf, wenn der COLOR FRAMING-Schalter auf der Geräterückseite auf ON gestellt ist, und das farbträgerverkoppelte Halbbild-Servosystem arbeitet.

**TIME CODE:** Diese Lampe leuchtet auf, wenn Zeitcode-Signale aufgezeichnet oder wiedergegeben werden.

**AUTO OFF:** Diese Lampe leuchtet auf, wenn im Inneren des Geräts Kondenswasser festgestellt wurde oder wenn die Bandspannung einen abnormalen Wert aufweist.

#### 7 Schrägfehler-Regler [SKEW]

Mit diesem Regler kann die Bandspannung eingestellt werden. Wurde das Band auf einem Gerät mit falsch eingestellter Bandspannung aufgenommen, so können bei der Wiedergabe Störungen im oberen Bildteil

entstehen. Stellen Sie den Regler so ein, daß das Wiedergabebild optimale Qualität aufweist. Der Regler kehrt automatisch in die Stellung FIXED zurück, wenn das Gerät auf Aufnahme gestellt wird.

- Dieser Regler arbeitet nicht bei Wiedergabe mit dynamischer Spurlage.

#### 8 Fernbedienung/Direkt-Wähler [REMOTE/LOCAL]

**REMOTE:** Stellen Sie den Wähler auf REMOTE, wenn das Gerät von einem BVU-800P, einem anderen BVU-820P oder einer am REMOTE-Anschluß angeschlossenen Schnittsteuereinheit aus fernbedient werden soll.

Die Funktionstasten (außer der STOP- und EJECT-Taste) arbeiten dann nicht.

**LOCAL:** Für den Fall, daß das Gerät an den eigenen Funktionstasten bedient werden soll oder daß das Gerät als Aufnahmegerät verwendet wird und einen weiteren am REMOTE-1 (9P)-Anschluß angeschlossenen BVU-800P oder anderen BVU-820P (Wiedergabe) fernbedient.

#### 9 Wiedergabekopf-Wähler [DT SELECT]

Dieser Wähler dient zur Wahl des Wiedergabekopfes: R/P (record/playback)- oder DT (dynamic tracking)-Kopf.

**SEARCH:** Zur Wiedergabe mit dynamischer Spurlage wird der DT-Kopf verwendet. Mit dem Suchlauf-Knopf kann die Wiedergabegeschwindigkeit von -10 facher bis +10 facher Normalgeschwindigkeit variiert werden, jedoch erhält man nur im Bereich -1 facher bis +3 facher Normalgeschwindigkeit ein störungsfreies Wiedergabebild.

**VAR:** Zur Wiedergabe mit dynamischer Spurlage wird der DT-Kopf verwendet. Mit dem Suchlauf-Knopf kann die Wiedergabegeschwindigkeit nur von -1 facher bis +3 facher Normalgeschwindigkeit variiert werden, wobei die Wiedergabe bei jeder beliebigen Stellung des Knopfes mit dynamischer Spurlage erfolgt.

**OFF:** Der R/P-Kopf wird verwendet.

- Dieser Schalter bleibt beim Aufnehmen und Schneiden ohne Einfluß.

#### 10 Fernbedienung-1/Fernbedienung-2-Wähler [REMOTE-1 (9P)/REMOTE-2 (36P)]

Steht der REMOTE/LOCAL-Wähler (8) auf REMOTE, so stellen Sie den REMOTE-1/REMOTE-2-Wähler in die entsprechende Stellung:

**REMOTE-1 (9P):** Bei Verwendung des 9-poligen Fernbedienungsanschlusses.

**REMOTE-2 (36P):** Bei Verwendung des 36-poligen Fernbedienungsanschlusses.

#### 11 Videoeingangs-Wähler [VIDEO INPUT SELECT]

Stellen Sie an diesem Wähler das aufzunehmende Videosignal ein.

**LINE:** Das an den VIDEO IN-Anschlüssen anliegende Signal wird aufgezeichnet.

**DUB:** Das am DUB-Anschluß anliegende Signal wird aufgezeichnet.



## ⑫ Bezugssignal-Wähler [MODE SELECT]

Stellen Sie hier das Bezugssignal für die Synchronisation ein.

TBC: Bei Wiedergabe mit Time-Base-Corrector.

NORMAL: Bei Wiedergabe ohne Time-Base-Corrector oder bei Aufnahme.

EDIT: Beim Schneiden

Der Zusammenhang zwischen diesem Wähler und dem SERVO LOCK-Wähler an der Rückseite kann aus der Tabelle im Abschnitt „Bezugssignal-Wähler und Synchronsignal-Wähler“ nachgeschlagen werden.

## ⑬ Misch-Wähler [MIXING SELECT]

Stellen Sie hier die Spur ein, auf die das Ton-Mischsignal von CH-1 und CH-2 aufgezeichnet werden soll.

to CH-1: Das Mischsignal wird auf CH-1 aufgezeichnet.

(Das Tonsignal von CH-2 wird auf CH-2 aufgezeichnet.)

OFF: Das Tonsignal CH-1 und CH-2 wird auf CH-1 bzw. CH-2 aufgezeichnet.

to CH-2: Das Mischsignal wird auf CH-2 aufgezeichnet.

(Das Tonsignal von CH-1 wird auf CH-1 aufgezeichnet.)

Mit diesem Wähler wird auch der Kanal eingestellt auf dem die Ton-Mischsignale bei E-zu-E-Betrieb herausgeleitet werden.

## ⑭ Tonpegel-Begrenzerschalter [AUDIO LIMITER]

Steht dieser Schalter auf ON, so arbeitet der Tonpegel-Begrenzerschaltkreis. Bei der Aufnahme reduziert dieser Schaltkreis plötzlich auftretende Pegelspitzen des Eingangssignals auf einen festen Pegel, so daß stets eine verzerrungsfreie Aufnahme hoher Qualität gewährleistet ist.

## ⑮ Wiedergabe-Tonpegel-Regler [AUDIO LEVEL PB] (innerer Regler)

Stellen Sie hier den Ausgangstonpegel von Tonsignal 1 und Tonsignal 2 ein. Stellen Sie die Regler bei Wiedergabe so ein, daß die VU-Meter ⑰ in den Spitzen bis 0 VU ausschlagen.

## ⑯ Wiedergabe-Tonpegel-Regler [AUDIO LEVEL PB] (äußerer Regler)

Stellen Sie hier den Eingangstonpegel von Tonsignal-1 und Tonsignal-2 ein. Befindet sich der Recorder im E-zu-E-Betrieb, so stellen Sie diese Regler so ein, daß die VU-Meter ⑰ in den Spitzen bis 0 VU ausschlagen.

## ⑰ VU-Meter

Befindet sich der Recorder im Aufnahme oder E-zu-E-Betrieb, so zeigen die VU-Meter den Eingangstonpegel an; befindet er sich im Wiedergabebetrieb, so zeigen die VU-Meter den Ausgangstonpegel an.

## ⑱ Kopfhörerbuchse [HEADPHONES] und Kopfhörerlautstärke-Regler

Hier kann ein 8-Ohm Stereokopfhörer angeschlossen werden. Der Ton kann bei Aufnahme, beim

Schnittvorgang und beim Wiedergabebetrieb mitgehört werden. Die Lautstärke des Mithörtons ist am Kopfhörerlautstärkeregelbar.

## ⑲ Tonsignal-Wähler [AUDIO MONITOR]

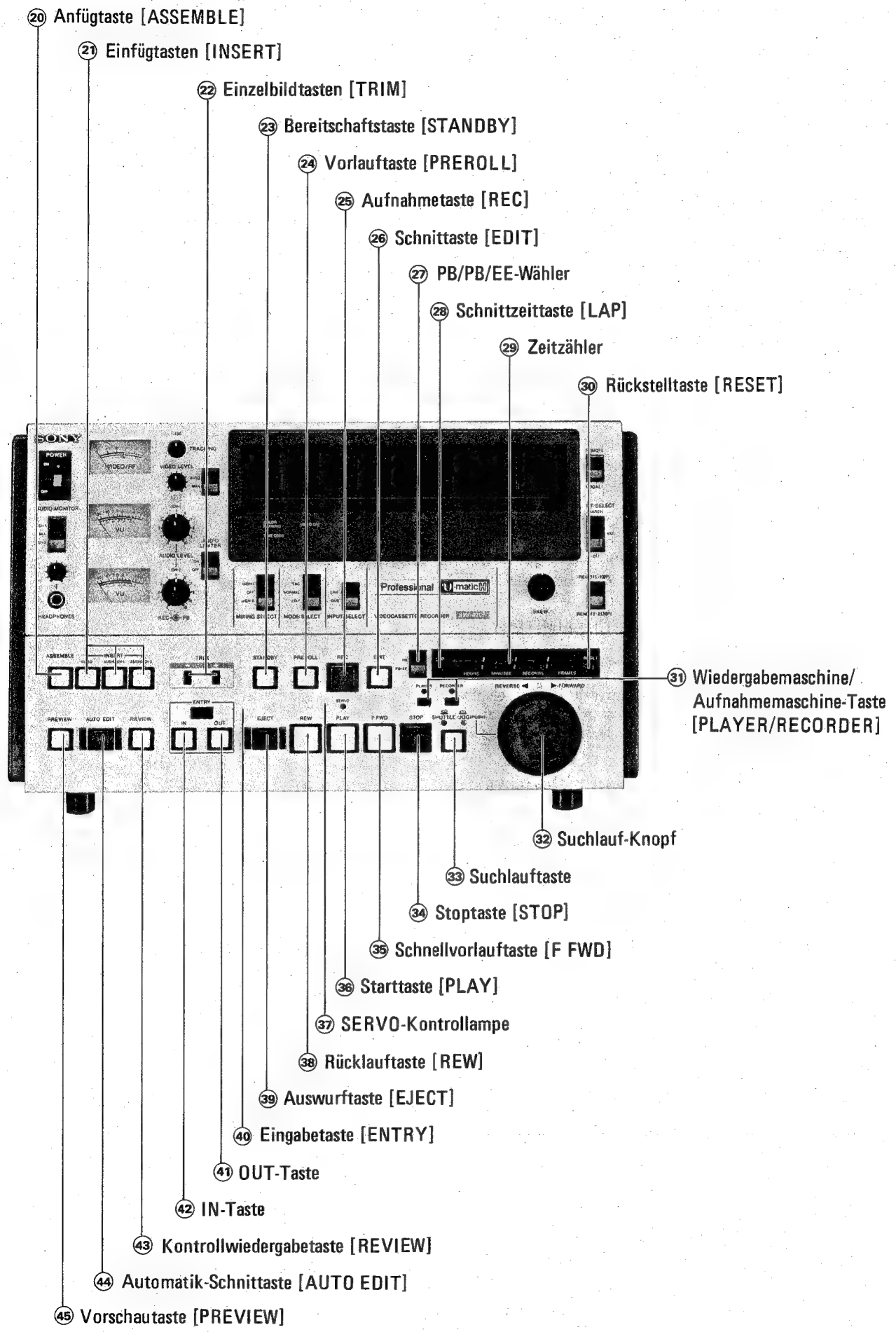
Hier kann das Tonausgangssignal der HEADPHONES-Buchse ⑱ und der auf der Rückseite befindlichen MONITOR-Anschlüsse gewählt werden.

CH-1: Tonsignal-1

MIX: Signal 1 und 2 liegt an der HEADPHONES-Buchse bzw. das Mischsignal aus beiden Signalen liegt an den MONITOR- und AUDIO OUT MONITOR-Anschlüssen an.

CH-2: Tonsignal-2







## 20 Anfügtaste [ASSEMBLE]

Drücken Sie diese Taste zum Anfügbetrieb. Durch nochmaliges Drücken wird der Anfügbetrieb wieder ausgeschaltet.

Wird diese Taste gedrückt, so arbeitet der R/P-Kopf, selbst wenn der DT SELECT-Wähler auf VAR oder SEARCH gestellt ist.

## 21 Einfügtasten [INSERT]

Wählen Sie an diesen Tasten das Eingangssignal für den Einfügbetrieb.

Wird eine dieser Tasten gedrückt, so arbeitet der R/P-Kopf, selbst wenn der DT SELECT-Wähler auf VAR oder SEARCH gestellt ist.

## 22 Einzelbildtasten [TRIM]

Der gespeicherte Schnittpunkt und Schnittpunkt kann um jede beliebige Anzahl von Einzelbildern verändert werden. Drücken Sie dazu die IN- oder OUT-Taste zusammen mit der entsprechenden Einzelbildtaste.

## 23 Bereitschaftstaste [STANDBY]

Wird der Netzschalter eingeschaltet, so leuchtet die STANDBY-Lampe und zeigt damit an, daß sich die Kopftrommel dreht und das Gerät betriebsbereit ist. Wird diese Taste während der Stopfunktion gedrückt, so bleibt die Kopftrommel stehen, und die Bandspannung verringert sich, um einer Beschädigung des Videokopfes vorzubeugen. Auf dem Bildschirm erscheint das E-zu-E-Bild. Drücken Sie die STANDBY-Taste erneut oder eine andere Betriebstaste (außer der STOP-Taste), um das Gerät wieder in den Stop-Betrieb oder einen anderen Betrieb umzuschalten.

## 24 Vorlauftaste [PREROLL]

Drücken Sie diese Taste, um das Band zu einem 10 Sekunden oder 5 Sekunden (je nach Stellung des Vorlaufzeit-Schalters) vor dem Schnittpunkt liegenden Punkt laufen zu lassen.

Wurde kein Schnittpunkt eingegeben, so wird der Punkt, an dem die Vorlauftaste gedrückt wird, als Schnittpunkt eingegeben, und der Vorlauf beginnt an diesem Punkt.

## 25 Aufnahmetaste [REC]

Drücken Sie diese Taste gleichzeitig mit der PLAY-Taste, um das Gerät in den Aufnahmebetrieb zu schalten.

Wird diese Taste im Wiedergabe-, Suchlauf-, Schnellvorlauf- oder Rücklaufbetrieb gedrückt, so erscheint das E-zu-E-Bild- und das Tonsignal. Wird die Taste wieder ausgerastet, so befindet sich das Gerät in der gleichen Betriebsfunktion wie vor dem Drücken der Taste. Beim Stopbetrieb erscheint bei gedrückter und ausgerasteter Taste das E-zu-E-Bild- und Tonsignal. Drücken Sie die STOP-Taste, um das Gerät wieder in der vorhergehenden Betriebszustand überzuführen.

## 26 Schnitttaste [EDIT]

Drücken Sie für manuellen Schnittbetrieb diese Taste gleichzeitig mit der PLAY-Taste.

Wird diese Taste im Wiedergabe-, Suchlauf-, Schnell-

vorlauf- oder Rücklaufbetrieb gedrückt, so erscheint das E-zu-E-Videosignal und das Tonsignal. Wird die Taste wieder ausgerastet, so befindet sich das Gerät in der gleichen Betriebsfunktion wie vor dem Drücken der Taste. Beim Stopbetrieb erscheint bei gedrückter und ausgerasteter Taste das E-zu-E-Bild- und Tonsignal. Drücken Sie die STOP-Taste, um das Gerät wieder in der vorhergehenden Betriebszustand überzuführen.

## 27 PB/PB/EE-Wähler

Stellen Sie hier das abzubildende Videosignal und das Tonsignal ein. Steht dieser Wähler auf PB, so ist bei Aufnahme- oder Schnittbetrieb gleichzeitig ein Wiedergabebild zu sehen. Genauere Informationen dazu finden Sie in der Tabelle auf Seite 1-76.

## 28 Schnittzeitaste [LAP]

Wird diese Taste gedrückt, so erscheint die Schnittzeit auf dem Zeitzähler.

## 29 Zeitzähler

Der Zeitzähler zeigt bei Normalgeschwindigkeit die bereits durchgelaufene Bandmenge in Stunden, Minuten, Sekunden und Einzelbildern an.

## 30 Rückstellaste [RESET]

Drücken Sie diese Taste, um die Anzeige des Zeitzählers auf „0:00:00:00“ zu stellen. Die gespeicherten Schnittpunkt- und Schnittpunkte werden beim Drücken dieser Taste gelöscht.

## 31 Wiedergabemaschine/Aufnahmemaschine-Taste [PLAYER/RECORDER]

Werden zum Schnittbetrieb zwei BVU-820P oder ein BVU-800P und ein BVU-820P zusammengeschaltet, so kann die Wiedergabemaschine von der Aufnahmemaschine aus fernbedient werden, wenn die PLAYER-Taste der Aufnahmemaschine gedrückt wird.

RECORDER-Taste: Drücken Sie diese Taste, um die Funktionstasten der Aufnahmemaschine in gewohnter Weise benutzen zu können.

PLAYER-Taste: Wird diese Taste gedrückt, so kann die Bereitschafts-, Auswurf-, Schnellvorlauf-, Wiedergabe-, Rücklauf-, Stop-, Shuttle-, Jog-, Vorlauf-, Eingabe-, IN/OUT-, Einzelbild- und Zeitzählerfunktion der Wiedergabemaschine von der Aufnahmemaschine aus fernbedient werden.

## 32 Suchlauf-Knopf

Mit diesem Knopf können die gewünschten Schnittpunkte schnell aufgefunden werden.

Durch Drücken des Knopfes geht das Gerät in den Jog-Betrieb und durch nochmaliges Drücken geht es in den Shuttle-Betrieb.

Die entsprechende Lampe leuchtet auf.

SHUTTLE: Drehen Sie den Knopf nach rechts oder links. Das Band läuft dann je nach Knopfstellung mit der entsprechenden Geschwindigkeit in Vorwärts- oder Rückwärtsrichtung.

Steht der DT SELECT-Wähler auf SEARCH oder OFF, so sind folgende Geschwindigkeiten möglich:

1/30, 1/10, 1/5, 1/2, 1, 2, 5 und 10 fach in beiden Richtungen. Am Klick-Punkt erhält man 10 fache Normalgeschwindigkeit und in der Mittelstellung ein Standbild.

Steht der DT SELECT-Wähler auf VAR, so sind folgende Geschwindigkeiten möglich: Ganz rechts – 3 fache Normalgeschwindigkeit in Vorwärtsrichtung; in der Mittelstellung – Standbild; ganz links – Normalgeschwindigkeit in Rückwärtsrichtung.

JOG: Drehen Sie den Knopf nach rechts oder nach links. Das Band bewegt sich dann entsprechend der Richtung und Geschwindigkeit der Knopfdrehung (von 0 bis Normalgeschwindigkeit). Wird der Knopf nicht gedreht, so erscheint ein Standbild.

- Achten Sie darauf, den Knopf beim Einschalten des Netzschalters vor dem Benutzen einmal kurz auf die Stellung ■ zu stellen.

## 33 Suchlauftaste

Drücken Sie diese Taste, um das Gerät in die Suchlauffunktion zu schalten.

## 34 Stoptaste [STOP]

Drücken Sie diese Taste, um das Gerät in die Stopfunktion zu schalten. Der Spulenmotor hält dann an, die Andruckrolle fährt zurück, die Kopftrommel dreht sich, und das Band bleibt eingefädelt.

## 35 Schnellvorlauftaste [F FWD]

Drücken Sie diese Taste, um das Band schnell vorzuspulen.

## 36 Starttaste [PLAY]

Drücken Sie zur Wiedergabe des Bandes diese Taste. Drücken Sie zur Aufnahme diese Taste gleichzeitig mit der REC-Taste.

Drücken Sie zum manuellen Schneiden während der Wiedergabe diese Taste gleichzeitig mit der EDIT-Taste. Drücken Sie während der manuellen Aufnahme diese Taste zum Stoppen des Aufnahmevorgangs.

## 37 SERVO-Kontrollampe

Diese Kontrollampe leuchtet auf, sobald das Servosystem der Kopftrommel und der Antriebswelle stabil arbeitet.

## 38 Rücklauftaste [REW]

Drücken Sie diese Taste zum Rückspulen des Bandes.

## 39 Auswurfaste [EJECT]

Drücken Sie diese Taste, um das Band auszufädeln und die Cassette auszuwerfen. Die Zähleranzeige wird auf „0:00:00:00“ zurückgestellt, wenn der Zeitzähler im CTL-Betrieb arbeitet.

- Achten Sie darauf, die Cassette jedesmal vor dem Ausschalten des Geräts herauszunehmen.

## 40 Eingabetaste [ENTRY]

Drücken Sie diese Taste zusammen mit der IN- oder OUT-Taste, um den Schnittpunkt- bzw. Schnittpunkt einzugeben.

## 41 OUT-Taste

Wird diese Taste zusammen mit der ENTRY-Taste gedrückt, so wird der Schnittpunkt eingegeben. Beim Drücken dieser Taste erscheint auf dem Zeitzähler die Einzelbildnummer des Schnittpunktes.

## 42 IN-Taste

Wird diese Taste zusammen mit der ENTRY-Taste gedrückt, so wird der Schnittpunkt eingegeben. Beim Drücken dieser Taste erscheint auf dem Zeitzähler die Einzelbildnummer des Schnittpunktes.

## 43 Kontrollwiedergabetaste [REVIEW]

Drücken Sie zum Überprüfen des beim Schnittvorgang aufgezeichneten Bild- und Tonsignals diese Taste.

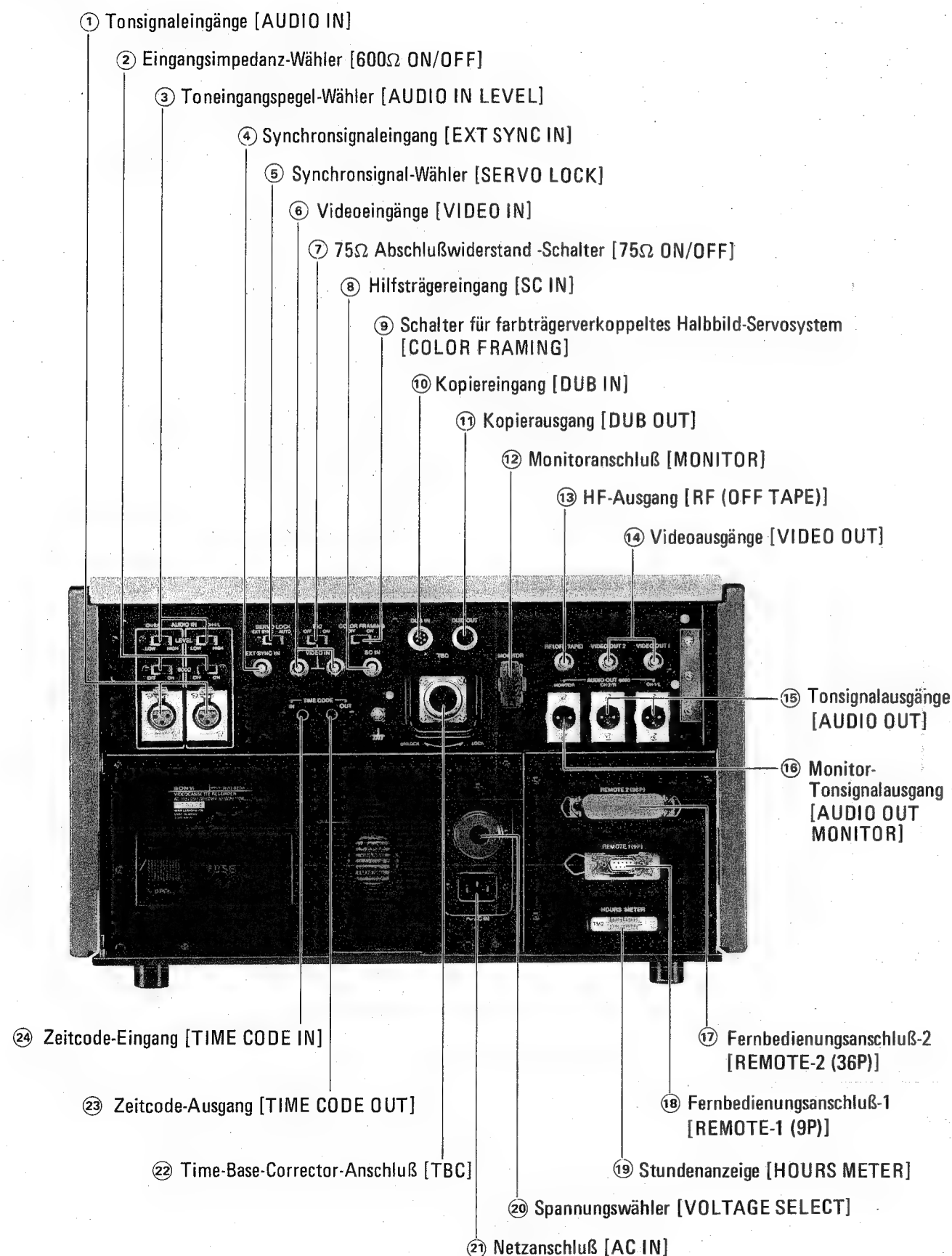
## 44 Automatik-Schnittaste [AUTO EDIT]

Drücken Sie diese Taste zum Starten des automatischen Schnittvorgangs.

## 45 Vorschautaste [PREVIEW]

Drücken Sie diese Taste zur Probenvorschau des Schnittvorgangs. Vor der eigentlichen Schnittaufnahme kann die Aufnahmeabfolge dann am Monitor überprüft werden.





# 1 Tonsignaleingänge [AUDIO IN] (CH-1/CH-2) (XLR-Buchsen)

Über diese Buchsen werden die Tonsignale von den Mikrofonen oder von anderen Audiogeräten zugeleitet. Der Eingangspegel und die Eingangsimpedanz können an den 600Ω ON/OFF-Wählern ② und an den AUDIO IN LEVEL-Wählern ③ eingestellt werden.

# 2 Eingangsimpedanz-Wähler [600Ω ON/OFF] (CH-1/CH-2)

Stehen die AUDIO IN LEVEL-Wähler ③ auf HIGH, so kann die Eingangsimpedanz an diesen Wählern eingestellt werden.  
 ON: 600Ω  
 OFF: 10 kΩ

# 3 Toneingangspegel-Wähler [AUDIO IN LEVEL]

Mit diesen Wählern kann die Empfindlichkeit der AUDIO IN-Anschlüsse ① eingestellt werden.  
 HIGH: +4 dB (zum Anschließen anderer Geräte)  
 LOW: -60 dB (zum Anschließen von Mikrofonen)

# 4 Synchronsignaleingang [EXT SYNC IN] (BNC)

Zum Anschluß eines externen Synchronsignals (0,2 Vss - 5 Vss). Es kann hier auch ein Videosignal (1 Vss) zugeleitet werden.

# 5 Synchronsignal-Wähler [SERVO LOCK]

**AUTO:** Stellen Sie den Wähler normalerweise in diese Stellung. Bei Aufnahmen wird dann das am VIDEO IN- oder DUB IN-Anschluß anliegende Signal als Bezugssignal herangezogen. Bei Wiedergabe wird das aus der Tabelle im Abschnitt „Bezugssignal-Wähler und Synchronsignal-Wähler“ zu entnehmende Signal als Bezugssignal herangezogen.

**EXT SYNC:** In dieser Stellung wird das Gerät unabhängig von der Stellung des an der Vorderseite angebrachten MODE SELECT-Wählers extern synchronisiert.

# 6 Videoeingänge [VIDEO IN] (BNC)

Diese Anschlüsse dienen zur Zuleitung des Aufnahme- oder des Video-Schnittaufnahmesignals. Von diesen beiden Anschlüssen kann einer als Schleifenausgang (Kettenschaltung) zu anderen Video-Geräten verwendet werden. Wird nur einer der Anschlüsse verwendet, so stellen Sie den 75Ω ON/OFF-Schalter ⑦ auf ON.

# 7 75Ω Abschlußwiderstand-Schalter [75Ω ON/OFF]

Durch diesen Schalter kann der Videoeingang mit 75Ω abgeschlossen werden.

ON: Normalstellung  
 OFF: Wenn einer der VIDEO IN-Anschlüsse als Schleifenausgang verwendet wird.

# 8 Hilfsträgereingang [SC IN] (BNC)

Bei Wiedergabe wird an diesem Eingang ein externes Hilfsträgersignal (4.43 MHz) zur Erzeugung des Chrominanzsignals zugeleitet. Normalerweise wird an diesem Anschluß ein Time-Base-Corrector angeschlossen.

# 9 Schalter für farbträgerverkoppeltes Halbbild-Servosystem [COLOR FRAMING]

**ON:** Zum Einschalten des farbträgerverkoppelten Halbbild-Servosystems während der automatischen Schnittaufnahme.

**OFF:** Bei Nichtverwendung des farbträgerverkoppelten Halbbild-Systems während der automatischen Schnittaufnahme.

- Die Vorlaufzeit ist bei Verwendung des farbträgerverkoppelten Halbbild-Servosystems auf 10 Sekunden zu stellen.

- Dieser Schalter arbeitet nur bei automatischen Schnittaufnahmen.

- Wird zum Schnittbetrieb mit dem Time-Base-Corrector BVT-500P der DUB OUT-Ausgang des BVT-500P mit dem DUB IN-Eingang des Recorders verbunden, so arbeitet das farbträgerverkoppelte Halbbild-Servosystem nicht.

Verbinden Sie den VIDEO IN-Anschluß des Recorders mit dem VIDEO OUT-Anschluß des BVT-500P.

# 10, 11 Kopiereingang und Kopierausgang [DUB IN/DUB OUT] (7-polig, Eingang: Stecker; Ausgang: Buchse)

Wird das Videosignal über den Kopierausgang und Kopiereingang (mittels gesondert lieferbarem Überspielkabel) von der Wiedergabemaschine zur Aufnahmemaschine geleitet, so erhält man eine bessere Bildqualität, als beim Kopieren über die Videoausgänge und Videoeingänge.

# 12 Monitoranschluß [MONITOR] (8-polig)

Schließen Sie hier einen Farbmonitor über ein Monitor-Anschlußkabel an. Das an diesem Anschluß anliegende Tonsignal kann an dem an der Vorderseite des Geräts angebrachten AUDIO MONITOR-Wähler und dem MIXING SELECT-Wähler eingestellt werden.

# 13 HF-Anschluß [RF] (BNC)

An diesem Anschluß liegt das unmodulierte FM-Signal an. Hier kann ein externer Dropout-Kompensator angeschlossen werden, wenn der eingebaute Dropout-Kompensator nicht verwendet wird.

# 14 Videoausgänge [VIDEO OUT] (BNC)

An den Videoausgängen können gleichzeitig ein Videomonitor, ein Recorder, ein Time-Base-Corrector etc. angeschlossen werden.



**⑮ Tonausgänge [AUDIO OUT]  
(CH-1/CH-2) (XLR-Stecker)**

An diesen Ausgängen liegen die Tonsignale an, deren Pegel an dem an der Vorderseite angebrachten AUDIO LEVEL-Regler eingestellt werden kann.

**⑯ Monitor-Tonsignalausgang [AUDIO OUT MONITOR]  
(XLR-Stecker)**

Schließen Sie hier das Tonmithör-System an. Das anliegende Ausgangssignal kann an dem an der Vorderseite angebrachten AUDIO MONITOR-Wähler und an dem MIXING SELECT-Wähler eingestellt werden.

**⑰ Fernbedienungsanschluß-2 [REMOTE-2 (36)] (36-polig)**

Schließen Sie hier eine Sony Schnittsteuer-Einheit der BVE-Serie (z.B. BVE-500ACE oder 5000P) mit einem gesondert lieferbaren 36-poligen Fernbedienungskabel an.

**⑱ Fernbedienungsanschluß-1 [REMOTE-1 (9)] (9-polig)**

Schließen Sie hier mit dem 9-poligen Fernbedienungskabel (mitgeliefert) einen weiteren BVU-820P, einen BVU-800P, einen BVE-800, einen BVH-2000PS oder einen DTR-2000 für Schnitt- oder Fernbedienungs-betrieb an.

**⑲ Stundenanzeige [HOURS METER]**

Diese Anzeige zeigt die gesamte Zeit an, die das Gerät im Aufnahme-, Wiedergabe-, Schnitt-, Suchlauf-, Schnellvorlauf- oder Rücklaufbetrieb verwendet wurde (bis maximal 1000 Stunden).

**⑳ Spannungswähler [VOLTAGE SELECT]**

Einstellbar auf 100, 120, 220 oder 240V Wechselspannung.

**㉑ Netzanschluß [AC IN]**

Schließen Sie hier das mitgelieferte Netzkabel an, und stecken Sie den Netzstecker in eine Wandsteckdose.

**㉒ Time-Base-Corrector-Anschluß [TBC]**

An diesem Anschluß kann ein Time-Base-Corrector angeschlossen werden.

**㉓ Zeitcode-Ausgang [TIME CODE OUT] (RCA-Cinch)**

An diesem Anschluß liegt das Wiedergabe-Zeitcode-signal an. Es kann ein Zeitcodeauswerter angeschlossen werden. Bei Aufnahme- und E-zu-E-Betrieb liegt hier das Zeitcode-Signal vom TIME CODE IN-Anschluß **㉔** an.

**㉔ Zeitcode-Eingang [TIME CODE IN] (RCA-Cinch)**

Schließen Sie hier zur Aufzeichnung des Zeitcode-Signals einen Zeitcode-Generator an.



## 1.4. AUFNAHME

### 1. VORBEREITUNGEN

Stellen Sie die Bedienungselemente auf die im folgenden angegebenen Stellungen.

**AUDIO IN LEVEL:** LOW oder HIGH

LOW: -60 dB, 3 k Ohm (zum Anschluß von Mikrofonen)

HIGH: +4 dB, 10 k Ohm/600 Ohm (zum Anschluß anderer Geräte)

Steht der Schalter in dieser Stellung, so stellen Sie den 600Ω-Wähler folgendermaßen ein:

ON: 600 Ohm

OFF: 10 k Ohm

**SERVO LOCK:**

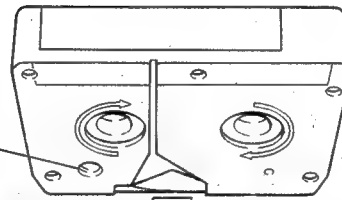
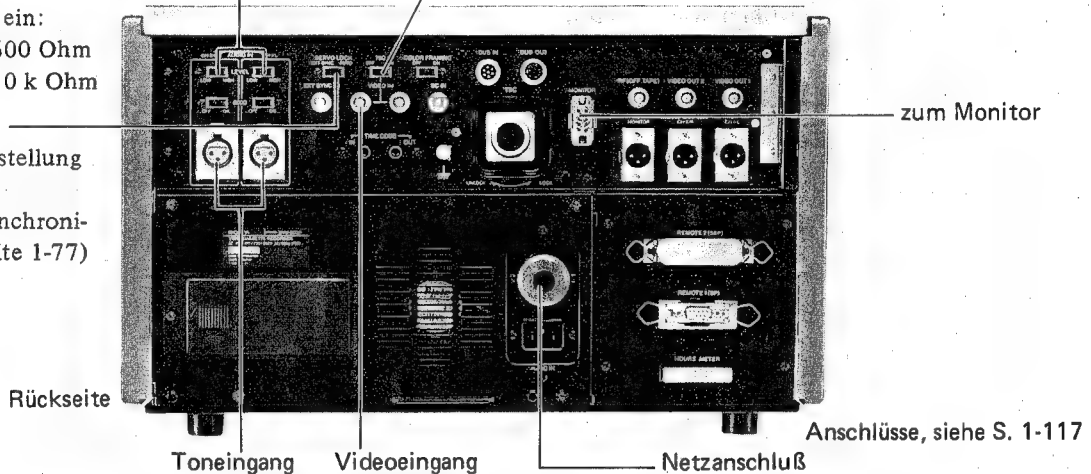
AUTO: Normalstellung

EXT SYNC:

Für externe Synchronisation (siehe Seite 1-77)

**75Ω ON/OFF:** ON

Stellen Sie den Schalter für Schleifenausgang auf OFF.



rote Kappe einsetzen

**TRACKING:** FIXED

**POWER:** ON

**AUDIO MONITOR:**  
normalerweise auf MIX

**REMOTE/LOCAL:**  
LOCAL

Vorderseite

**MIXING SELECT:** normalerweise auf OFF

**MODE SELECT:** NORMAL

**PB/PB/EE:** normalerweise auf PB/EE

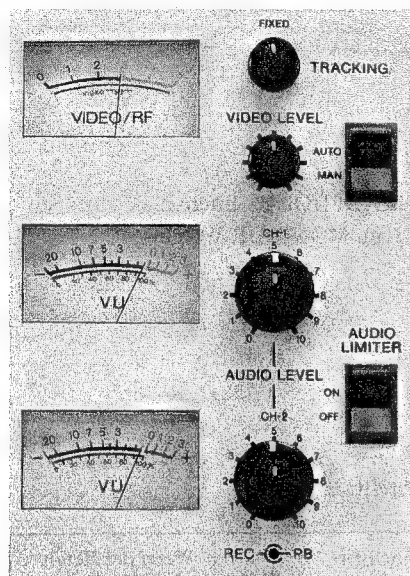
**INPUT SELECT:** LINE oder DUB

LINE: Das Videosignal des am VIDEO IN-Anschluß angeschlossenen Geräts wird aufgenommen.

DUB: Das Videosignal des am DUB IN-Anschluß angeschlossenen Wiedergabegeräts wird aufgenommen.



## 2. EINSTELLUNG DES VIDEO- UND TONPEGELS



### Videopegel

Stellen Sie zur automatischen Videopegel-Aussteuerung den AUTO/MAN-Wähler auf AUTO.

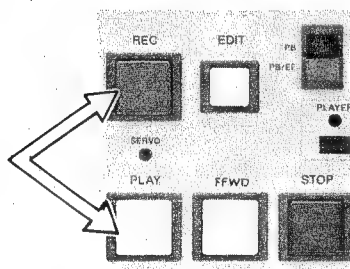
Stellen Sie zur manuellen Videopegel-Aussteuerung den AUTO/MAN-Wähler auf MAN, und regulieren Sie den VIDEO LEVEL-Regler so ein, daß der Zeiger der Pegelanzeige sich im blauen Bereich bewegt.

### Tonpegel

Stellen Sie den AUDIO LIMITER-Schalter auf OFF. Stellen Sie dann die AUDIO LEVEL-Regler für Kanal 1 und Kanal 2 so ein, daß die VU-Meter maximal bis 0 ausschlagen.

Stellen Sie für Aufnahmen mit Tonpegel-Begrenzung den AUDIO LIMITER-Schalter auf ON.

## 3. STARTEN DER AUFNAHME



Drücken Sie gleichzeitig die REC- und die PLAY-Taste.

Es dauert einige Sekunden, bis das Kopftrommel- und Bandantriebswellen-Servo-System stabil arbeitet. Die SERVO-Kontrollampe leuchtet dann auf.

Außerdem leuchten die Anzeigen: REC, PLAY, STANDBY.

Drücken Sie zum Stoppen der Aufnahme die STOP-Taste.

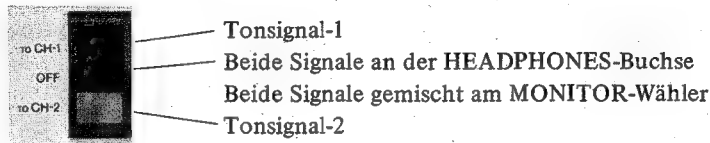
Es leuchten die Anzeigen: STOP, STANDBY.

Ist das Band bis zum Ende durchgelaufen, so wird es automatisch zurückgespult und am Bandanfang angehalten.



ABGREIFEN VON VIDEO- UND TONSIGNAL

- Videosignal: Es kann am VIDEO OUT- oder am MONITOR-Anschluß abgegriffen werden.
- Tonsignal: Zum Abgreifen des Tonsignals kann am AUDIO MONITOR-Anschluß ein Audiosystem, am MONITOR-Anschluß ein Monitor oder an der HEADPHONES-Buchse ein Stereo-Kopfhörer angeschlossen werden. Das anliegende Tonsignal kann folgendermaßen am AUDIO MONITOR-Wähler eingestellt werden.



STELLUNG DES PB/PB/EE-WÄHLERS

Mit diesem Wähler wird das Monitorbildsignal und das Monitortonsignal eingestellt.

Betriebsart Stellung des Wählers	Cassetten- auswurf	Einfädeln oder Ausfädeln	Wieder- gabe	Auf- nahme	Schnitt	Such- lauf	Schnellvor- oder Rücklauf	Stop	Wenn der Bereit- schaftsbetrieb ausgeschaltet wird
PB/EE	EE	EE	PB	EE	EE	PB	EE	EE	EE
PB	EE	EE	PB	Bild: gleichzei- tige PB Ton: EE	Bild: gleichzei- tige PB Ton: EE	PB	PB	PB	PB

Beim Drücken der REC-Taste während des Wiedergabe-, Suchlauf-, Schnellvorlauf- oder Rücklaufbetriebs erscheint auf dem Monitor das E-zu-E-Bild- und Tonsignal. Beim Drücken der EDIT-Taste kann am Monitor das E-zu-E-Bild- und das an der ASSEMBLE- oder INSERT-Taste gewählte Tonsignal kontrolliert werden. Wird die Taste ausgerastet, so geht das Gerät wieder in den vorhergehenden Betriebszustand über.

Während des Stopbetriebs erscheint beim Drücken und Ausrasten der REC- oder EDIT-Taste das E-zu-E-Bild- und Tonsignal weiter am Monitor. Drücken Sie die STOP-Taste, um das Gerät in den vorhergehenden Betriebszustand überzuführen, oder drücken Sie die entsprechende Taste zum Überführen in einen anderen Betriebszustand.



BEZUGSIGNALWÄHLER UND SYNCHRONSIGNAL-WÄHLER


Mit diesen Wählern kann das am VIDEO IN- oder am DUB IN-Anschluß anliegende Videosignal, das am EXT SYNC IN-Anschluß anliegende externe Signal oder das interne Synchronisationssignal als Bezugssignal für die Synchronisation ausgewählt werden.

Stellung des SERVO LOCK- Wählers		AUTO			EXT SYNC	
Betriebsart des Video-Recorders		Aufnahme	Wiedergabe, E-E		Aufnahme	Wiedergabe, E-E
Stellung des MODE SELECT-Wählers		EDIT, NORMAL, TBC	EDIT	NORMAL, TBC	EDIT, NORMAL, TBC	
Eingangssignal an VIDEO IN oder DUB IN	EXT SYNC IN					
ja	ja	VIDEO	VIDEO (EXT SYNC)*	EXT SYNC (VIDEO)**	EXT SYNC IN	
ja	nein	VIDEO	VIDEO (internes Synchroni- sationssignal)*		VIDEO	VIDEO (Internes Synchroni- sationssignal)*
nein	ja		EXT SYNC IN			
nein	nein		Internes Synchronisationssignal			

- \* Ist ein BVE-500ACE, BVE-800, zwei BVU-820P, oder ein BVU-800P und ein BVU-820P zum Schneiden angeschlossen, und befindet sich das Gerät nicht in Wiedergabe, so ist das Bezugssignal der Synchronisierung in den Klammern angegeben.
- \*\* Ist die ASSEMBLE- oder eine der INSERT-Tasten gedrückt und leuchtet, und befindet sich der Videorecorder im Wiedergabebetrieb oder leuchtet die EDIT-Taste, so erhält man das in Klammern angegebene Servo-Referenzsignal.

MISCHUNG DER TONSIGNALE

Beim Aufnehmen können die Tonsignale von Kanal 1 und Kanal 2 gemischt werden. Es ist auch möglich, das gemischte Tonsignal entweder auf Spur 1 oder Spur 2 aufzunehmen. Stellen Sie dazu den MIXING SELECT-Wähler wie folgt ein:

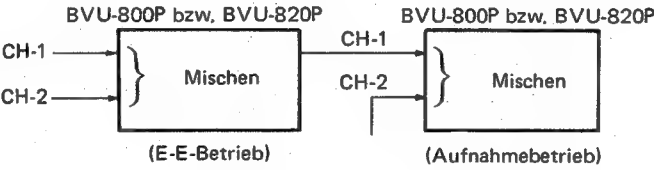


Das Mischsignal wird auf Spur 1 aufgezeichnet.  
(Das Tonsignal von Kanal 2 wird auf Spur 2 aufgezeichnet.)

Das Tonsignal von Kanal 1 und Kanal 2 wird auf den entsprechenden Spuren aufgezeichnet.

Das Mischsignal wird auf Spur 2 aufgezeichnet.  
(Das Tonsignal von Kanal 1 wird auf Spur 1 aufgezeichnet.)

- Das Mischsignal aus Tonsignal-1 und Tonsignal-2 wird mit gleichem Pegel gemischt aufgezeichnet.
- Werden zwei BVU-820P oder ein BVU-800P und ein BVU-820P zusammengeschaltet, so können drei Tonsignale gemischt werden.



BANDSCHUTZAUTOMATIK

Befindet sich das Gerät länger als 8 Minuten in der Stopfunktion, so wird der Bereitschaftsbetrieb automatisch abgeschaltet (die Kopftrommel bleibt stehen), um das Band und die Videoköpfe zu schonen. Wird das Band im Suchlaufbetrieb länger als 8 Minuten angehalten, so läuft es mit 1/30 der Normalgeschwindigkeit in Vorwärtsrichtung weiter. Bringen Sie dann das Gerät durch Drücken der entsprechenden Taste in die gewünschte Betriebsfunktion (außer Stopfunktion). Um das Gerät in die Stopfunktion zu bringen, muß die STANDBY-Taste gedrückt werden.

KONDENSWASSERANSAMMLUNG

Wenn sich Kondenswasser angesammelt hat, so bleibt der Kopftrommel- und der Antriebswellen-Motor stehen, und die Cassette wird ausgeworfen. An der Vorderseite des Geräts leuchtet dann die AUTO OFF-Lampe auf. Nach kurzer Zeit setzt sich die Kopftrommel wieder in Bewegung. Ist die AUTO OFF-Lampe wieder erloschen, so warten Sie noch etwa 10 Minuten, bevor Sie das Gerät benutzen.

- Wird ein Gerät der BVR-Serie angeschlossen, so stellen Sie die Ansprechzeit der Bandschutzautomatik auf 10 Minuten ein. Genauere Informationen dazu finden Sie in der Bedienungsanleitung des betreffenden Geräts.

ZEITCODE-AUFZEICHNUNG

Schließen Sie zur gleichzeitigen Aufzeichnung des Zeitcodes einen EBU-Zeitcode-Generator am TIME CODE IN-Anschluß an. Da beim Aufzeichnen des Zeitcodes ein Begrenzer wirksam ist, braucht keine Einstellung vorgenommen zu werden. Beim Aufnehmen leuchtet die TIME CODE-Anzeige.



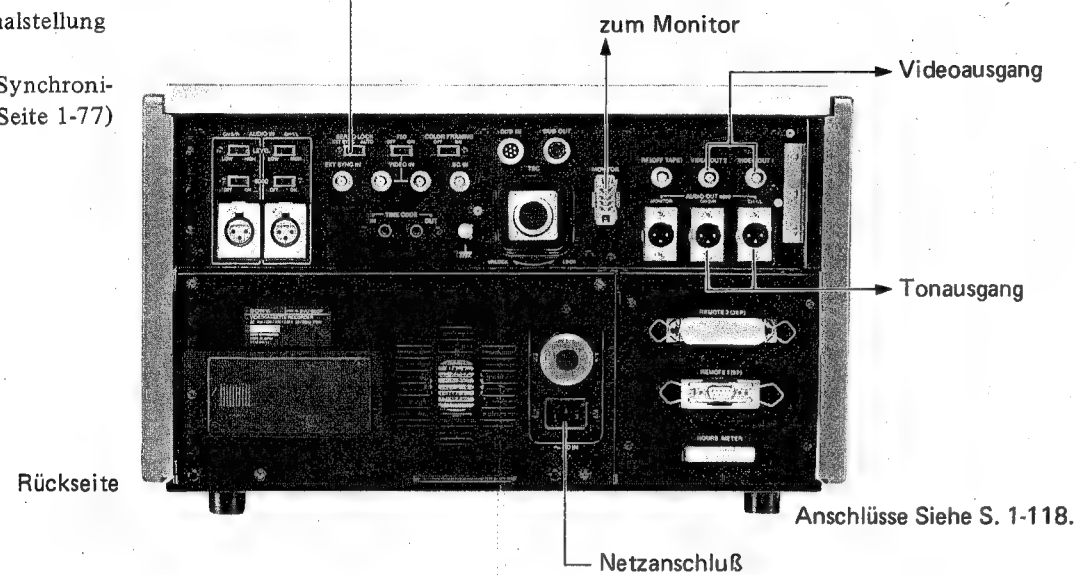
## 1-5. WIEDERGABE

### 1. VORBEREITUNG

Stellen Sie die Bedienungselemente folgendermaßen ein:

#### SERVO LOCK:

AUTO: Normalstellung  
EXT SYNC:  
Für externe Synchronisation (siehe Seite 1-77)



eine bespielte Videocassette einlegen

TRACKING: FIXED

POWER: ON

AUDIO MONITOR:  
MIX, normalerweise

REMOTE/LOCAL:  
LOCAL

DT SELECT: OFF

SKEW: FIXED

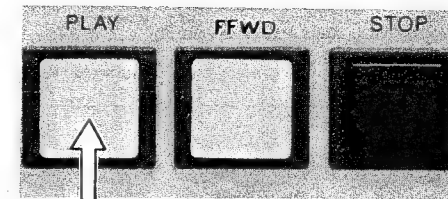
MODE SELECT: normalerweise auf NORMAL

PB/PB/EE: normalerweise auf PB

INPUT SELECT:

Wird das Videosignal als Bezugssignal herangezogen, so stellen Sie den Wähler auf den Anschluß, an dem das Videosignal angeschlossen ist.

### 2. STARTEN DER WIEDERGABE



Drücken Sie die PLAY-Taste.

Das Kopftrommel- und das Antriebswellen-Servo-System brauchen einige Sekunden, bevor sie stabil arbeiten. Bei stabilem Betrieb leuchtet die SERVO-Kontrolllampe auf.

Es leuchten die Lampen: PLAY, STANDBY.

Drücken Sie zum Stoppen der Wiedergabe die STOP-Taste.

Es leuchten die Lampen: STOP, STANDBY.

Ist das Band bis zum Ende durchgelaufen, so wird es automatisch zurückgespult und am Bandanfang angehalten.

### 3. EINSTELLUNGEN

#### SPURLAGE- UND SCHRÄGFEHLER-EINSTELLUNG

Stellen Sie die Regler normalerweise auf FIXED.

Ist das Wiedergabebild gestört, so drehen Sie den TRACKING-Regler nach links oder nach rechts, so daß der Zeiger der VIDEO/RF-Anzeige möglichst weit ausschlägt.

- Achten Sie darauf, daß der DT SELECT-Wähler während der Spurlage-Einstellung auf OFF steht.
- Stellen Sie den Regler nach beendeter Wiedergabe dieses speziellen Bandes wieder auf FIXED.

Treten Störungen im oberen Bildteil auf, so stellen Sie den SKEW-Regler so ein, daß die Bildqualität optimal ist.

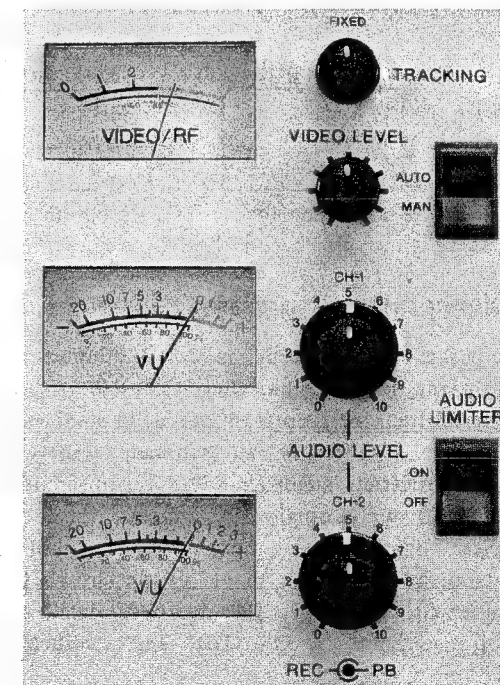
#### EINSTELLUNG DES VIDEO- UND TONPEGELS

Videopegel:

Der Videopegel wird automatisch eingestellt.

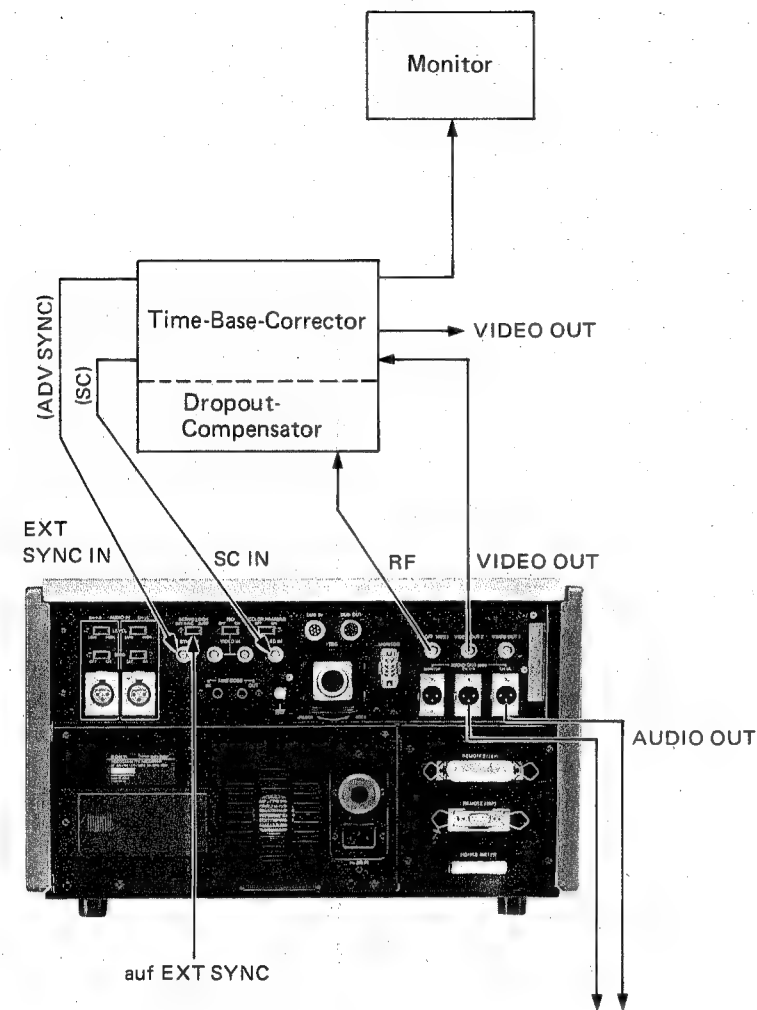
Tonpegel:

Stellen Sie die AUDIO LEVEL-Regler für Tonsignal-1 und Tonsignal-2 bei Wiedergabe so ein, daß die VU-Meter in den Spitzen bis 0 ausschlagen.





WIEDERGABE MIT EINEM TIME-BASE-CORRECTOR



Stellen Sie den auf der Vorderseite angebrachten MODE SELECT-Wähler auf TBC.

ABGREIFEN VON VIDEO- UND TONSIGNAL

Siehe Seite 1-76.

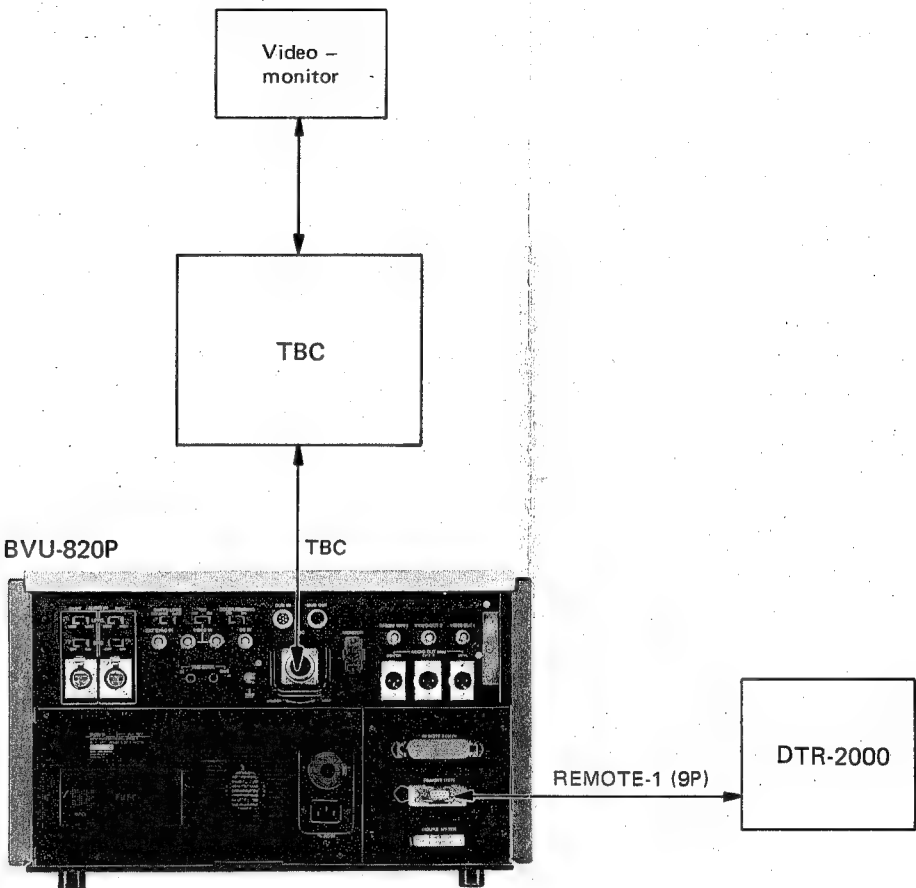
AUTOMATISCHE ABSCHALTUNG

Siehe Seite 1-77.

ZEITCODE-WIEDERGABE

Schließen Sie zur Auswertung des EBU-Zeitcodes einen Zeitcode-Auswerter am TIME CODE OUT-Anschluß an. Bei Wiedergabebetrieb leuchtet dann die TIME CODE-Lampe auf.

WIEDERGABE MIT EINER DTR-2000



Bei Verwendung der Dynamik-Steuereinheit DTR-2000 sind folgende Funktionen möglich:

- Speicherung von bis zu 5 Cue-Punkten. Bei Einbau einer als Sonderzubehör erhältlichen Tastatur können 150 Cue-Punkte gespeichert werden.
- Die Cue-Punkt-Daten können zur Erhaltung auf eine Tonspur des Bandes aufgenommen oder von einem Fernschreiber auf Lochstreifen gespeichert werden.
- Jeder Cue-Punkt kann automatisch aufgesucht werden.
- Ein Wiedergabe-Programm mit verschiedenen Geschwindigkeiten kann gespeichert und wiederholt wiedergegeben werden.

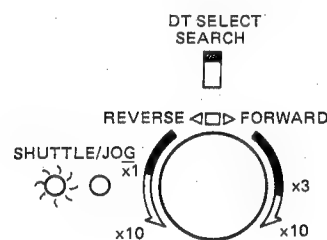


## WIEDERGABE MIT DYNAMISCHER SPURLAGE

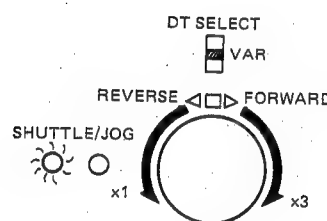
Steht der DT SELECT-Wähler auf SEARCH oder VAR, erhält man bei  $-1$  facher bis  $+3$  facher Normalgeschwindigkeit ein Wiedergabebild ohne jegliche Spurrasen-Störungen. Dies wird als Wiedergabe mit dynamischer Spurlage bezeichnet.

- Verwenden Sie bei Wiedergabe mit dynamischer Spurlage auf jeden Fall einen Time-Base-Corrector, da es sonst zu Bildzittern oder Bildverzerrungen kommt.
- Geben Sie das Band erst mindestens 8 Sekunden mit Normalgeschwindigkeit wieder, nachdem Sie das Gerät eingeschaltet oder die Cassette gewechselt haben, und schalten Sie erst dann auf dynamische Spurlage um.

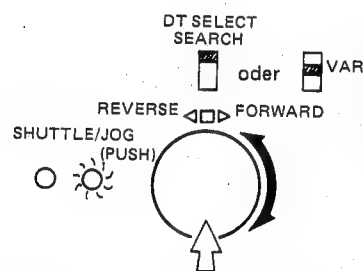
Stellen Sie den DT SELECT-Schalter auf SEARCH oder VAR und drücken Sie die PLAY-Taste. Die Wiedergabe mit dynamischer Spurlage beginnt dann und mit dem Suchlauf-Knopf können folgende Geschwindigkeiten eingestellt werden.



Die Wiedergabegeschwindigkeit kann von  $-10$  fach bis  $+10$  fach variiert werden; Wiedergabe mit dynamischer Spurlage ist jedoch nur im Bereich  $-1$  facher bis  $+3$  facher Normalgeschwindigkeit möglich.



Wird der Knopf ganz nach links gedreht, so erfolgt die Wiedergabe mit  $-1$  facher Normalgeschwindigkeit und wird er ganz nach rechts gedreht, so erfolgt sie mit  $+3$  facher Normalgeschwindigkeit. In allen Stellungen erhält man eine Wiedergabe mit dynamischer Spurlage.



Wird der Suchlauf-Knopf gedrückt, befindet sich der Videorecorder im Jog-Betrieb und man erhält eine Wiedergabe mit dynamischer Spurlage entsprechend der Knopf-Drehgeschwindigkeit. Beim Anhalten des Knopfes erhält man ein störungsfreies Standbild.

■ : Wiedergabe mit dynamischer Spurlage

### Hinweise:

- Bei Verwendung des R/P-Kopfes erhält man eine bessere Wiedergabe-Bildqualität als bei Verwendung des DT-Kopfes. Beim Kopieren oder Schneiden eines Bandes sollte deshalb des R/P-Kopf verwendet werden.
- Beim Kopieren eines Wiedergabebildes mit dynamischer Spurlage erhält man bessere Qualität, wenn man statt des DUB OUT-Anschlusses den VIDEO OUT-Anschluß verwendet.

## Automatischer Kopf-Wechsel

### Bei Verwendung des BVU-820P als Wiedergabemaschine

Wenn die REVIEW- oder AUTO EDIT-Taste gedrückt wird, so erfolgt automatisch während der Vorlaufzeit ein Wechsel vom DT- auf den R/P-Kopf, selbst wenn der DT SELECT-Wähler auf SEARCH oder VAR steht. Während des automatischen Schnittbetriebs wird also stets das vom R/P-Kopf wiedergegebene Bildsignal von der Wiedergabe- zur Aufnahmemaschine geleitet, unabhängig von der Stellung des DT SELECT-Wählers. Am Ende des Schnittvorgangs wird dann automatisch wieder auf den DT-Kopf gewechselt.

### Hinweis:

Der automatische Kopfwechsel arbeitet nur, wenn der BVU-820P, BVU-800P oder BVE-800 an den REMOTE-1 (9P)-Anschluß angeschlossen ist. Wenn der REMOTE-2 (36P)-Anschluß verwendet wird oder ein anderes Gerät an den REMOTE-1 (9P)-Anschluß angeschlossen wird oder wenn die Wiedergabemaschine auf manuellen Schnittbetrieb geschaltet ist, so arbeitet der automatische Kopf-Wechsel nicht und der DT SELECT-Wähler ist zum Schnittbetrieb deshalb auf OFF zu stellen.

### Bei Verwendung des BVU-820P als Aufnahmemaschine

Sind die REC- und PLAY-Taste oder ist eine der ASSEMBLE- bzw. INSERT-Tasten gedrückt, so wird automatisch auf den R/P-Kopf umgeschaltet, selbst wenn der DT SELECT-Wähler auf SEARCH oder VAR steht. Wird jedoch der Suchlauf-Knopf gedreht, nachdem zuvor die ASSEMBLE oder INSERT-Taste gedrückt und der DT SELECT-Wähler auf SEARCH oder VAR gestellt wurde, so wird auf den DT-Kopf geschaltet und man erhält ein störungsfreies Wiedergabebild. Durch Drücken der PREVIEW-, der AUTO EDIT oder PLAY-Taste wird wieder auf den R/P-Kopf gewechselt. Die Bedienung kann am Bedienungspult des BVU-820P oder an Geräten, die am REMOTE-1 (9P)- oder REMOTE-2 (36P)-Anschluß angeschlossen sind, erfolgen.



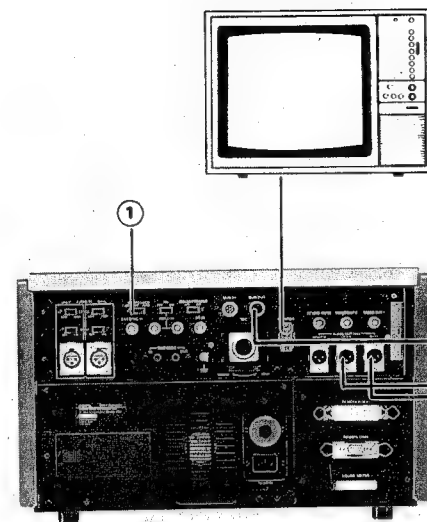
## 1-6. SCHNEIDEN

### 1-6-1. SCHNEIDEN UNTER VERWENDUNG VON ZWEI BVU-820P VIDEO-CASSETTENRECORDERN

#### 1. VORBEREITUNGEN

##### WIEDERGABEMASCHINE

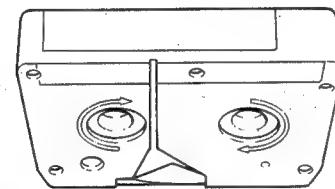
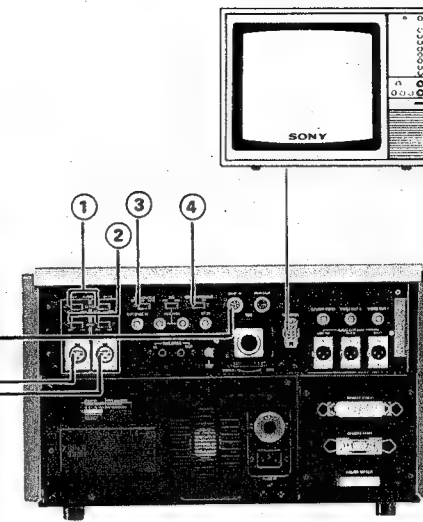
- ① **SERVO LOCK:**  
 AUTO: Normalstellung  
 EXT SYNC: Für externe Synchronisation



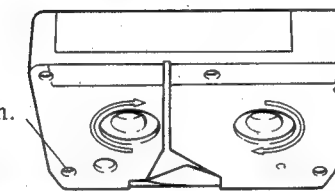
Siehe Abb. im Kapitel „ANSCHLÜSSE“.

##### AUFNAHMEMASCHINE

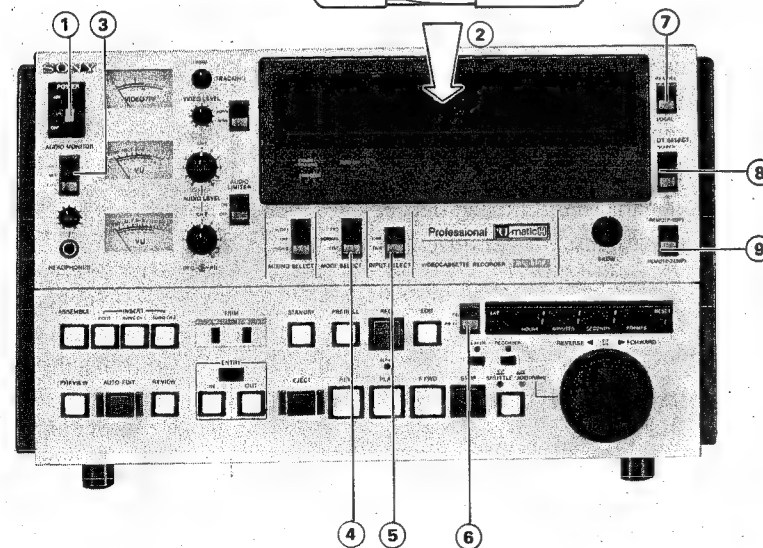
- ① **AUDIO IN LEVEL:** HIGH
- ② **600Ω:** ON
- ③ **SERVO LOCK:**  
 AUTO: Normalstellung  
 EXT SYNC: Für externe Synchronisation
- ④ **COLOR FRAMING:** ON  
 Soll das farbträgerverkoppelte Halbbild-Servosystem bei der automatischen Schnittaufnahme nicht verwendet werden, so stellen Sie den Schalter auf OFF.



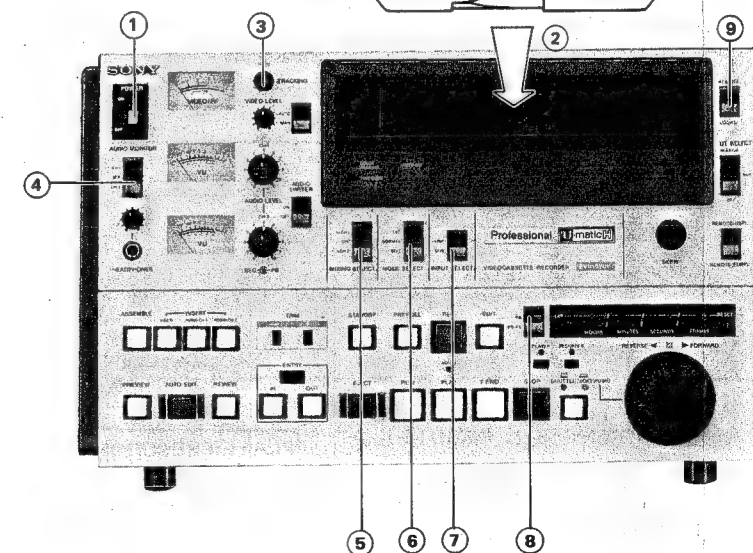
Die rote Kappe einsetzen.



- ① **POWER:** ON
- ② Legen Sie eine bespielte Video-Cassette ein.
- ③ **AUDIO MONITOR:** MIX
- ④ **MODE SELECT:** EDIT
- ⑤ **INPUT SELECT:**  
 Wird das Video-Eingangssignal als Bezugssignal herangezogen, so stellen Sie diesen Schalter auf den Anschluß, an dem das Signal anliegt.
- ⑥ **PB/PB/EE:** PB
- ⑦ **REMOTE/LOCAL:** REMOTE
- ⑧ **DT SELECT:** OFF
- ⑨ **REMOTE-1/REMOTE-2:** REMOTE-1  
 Stellen Sie den Video- und Tonpegel sowie die Spurlage und den Schrägfehler wie auf Seite 1-80 gezeigt ein.

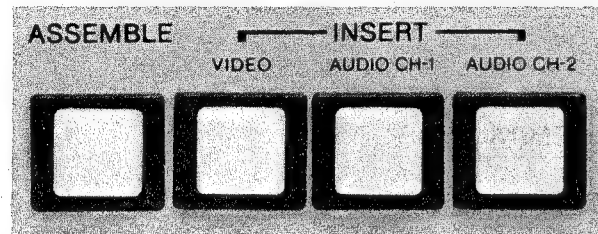


- ① **POWER:** ON
- ② Legen Sie die Cassette für die Schnittaufnahme ein.
- ③ **TRACKING:** FIXED
- ④ **AUDIO MONITOR:** MIX
- ⑤ **MIXING SELECT:** OFF
- ⑥ **MODE SELECT:** EDIT
- ⑦ **INPUT SELECT:** DUB  
 Wird zum Anschluß des von der Wiedergabemaschine zugeleiteten Videosignals der VIDEO IN-Anschluß verwendet, so stellen Sie den Wähler auf LINE.
- ⑧ **PB/PB/EE:** PB/EE
- ⑨ **REMOTE/LOCAL:** LOCAL  
 Stellen Sie den Video- und Audiopegel wie auf Seite 1-75 gezeigt ein.





## 2. WÄHLEN DER SCHNITTBETRIEBSART



### ANFÜGSCHNITT

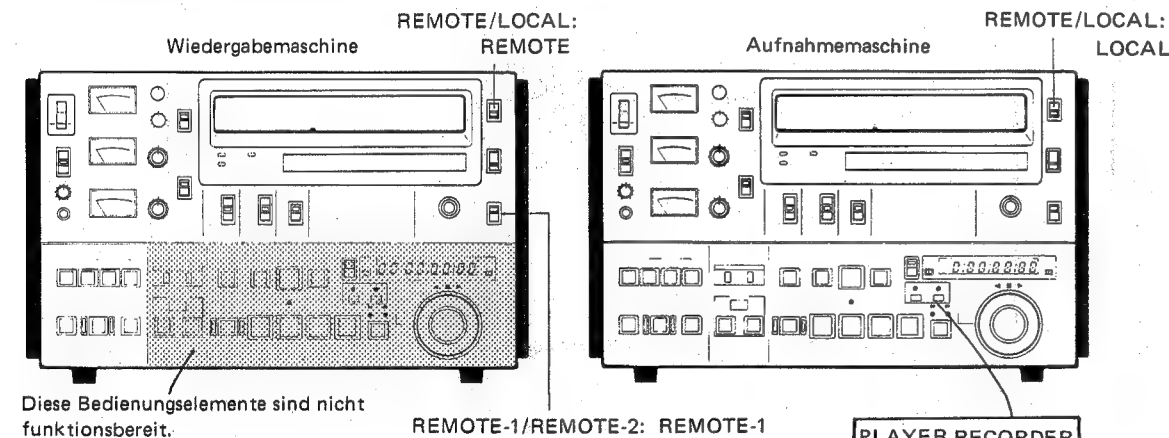
- 1 Drücken Sie die RECORDER-Taste an der Aufnahmemaschine. Die RECORDER-Anzeige leuchtet auf.
- 2 Drücken Sie die ASSEMBLE-Taste an der Aufnahmemaschine.

### EINFÜGSCHNITT

- 1 Drücken Sie die RECORDER-Taste an der Aufnahmemaschine. Die RECORDER-Anzeige leuchtet auf.
- 2 Wählen Sie das gewünschte Eingangssignal mit Hilfe einer oder aller INSERT-Tasten an der Aufnahmemaschine. Das jeweilige Signal wird wieder abgeschaltet, wenn die Taste erneut gedrückt wird.

### WICHTIG

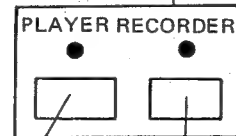
Werden zwei BVU-820P oder ein BVU-800P und ein BVU-820P Video-Cassettenrecorder für den Schnittbetrieb verwendet, so steuern die an der Vorderseite der Aufnahmemaschine angebrachten Regler den Recorder selbst und außerdem folgende Funktionen der Wiedergabemaschine: Bereitschaft, Vorlauf, Auswurf, Schnellvorlauf, Wiedergabe, Rücklauf, Stop, Suchlauf (Jog und Shuttle), Eingabe IN/OUT, Einzelbild, Rückstellen und Zeitzehlereinstellungen. Auf den folgenden Seiten wird der Bedienungsvorgang des Schnittbetriebs unter ausschließlicher Verwendung der an der Vorderseite der Aufnahmemaschine angebrachten Bedienungselemente erläutert.



Diese Bedienungselemente sind nicht funktionsbereit.

REMOTE-1/REMOTE-2: REMOTE-1

Drücken Sie diese Taste, um die Wiedergabemaschine von den Funktionstasten der Aufnahmemaschine aus fernzubedienen. Die Funktionsanzeigen sowie die Suchlauf- und SERVO-Kontrollampe leuchtet wie an der Wiedergabemaschine.



Drücken Sie diese Taste, um die Funktionstasten für die Aufnahmemaschine selbst zu verwenden.

- Steht der REMOTE/LOCAL-Wähler sowohl an der Wiedergabemaschine als auch an der Aufnahmemaschine auf LOCAL, so steuern die Funktionstasten beider Maschinen nur die jeweiligen Maschinen selbst. In diesem Fall muß die PREVIEW-, AUTO EDIT- und REVIEW-Taste der Aufnahmemaschine bedient werden.
- Wird nach Drücken einer Funktionstaste die gewünschte Funktion nicht ausgeführt, so schalten Sie den POWER-Schalter einmal aus (Reset) und wieder ein. Bedienen Sie dann die Funktionstaste erneut.

## 3. FESTLEGUNG DES SCHNITTANFANGS- UND SCHNITTENDPUNKTES

Die gewählten Signale zwischen den Schnittanfangs- und Schnittpunkten werden in die gewünschten Bandteile der Aufnahmemaschine geschnitten. Es wird die Bedienungsabfolge unter ausschließlicher Verwendung der an der Vorderseite der Aufnahmemaschine angebrachten Bedienungselemente erläutert. Die Aufnahmemaschine wird fernbedient.

### SCHNITTANFANGSPUNKT DER WIEDERGABEMASCHINE

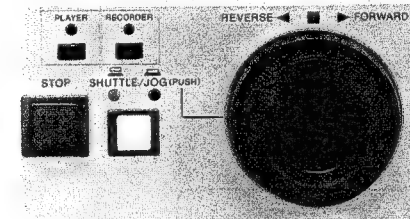
- 1 Drücken Sie die PLAYER-Taste.



Die PLAYER-Lampe leuchtet auf.

- 2 Die SHUTTLE- und JOG-Lampe an der linken Seite des Suchlauf-Knopfes zeigen an, ob sich der Suchlauf-Knopf im Shuttle- oder Jog-Betrieb befindet. Drücken Sie den Suchlauf-Knopf hinein, so daß die SHUTTLE-Lampe aufleuchtet.

- 3 Stellen Sie am Suchlauf-Knopf die Bandgeschwindigkeit ein.



Die Bandgeschwindigkeit kann in beiden Richtungen von 1/30, 1/10, 1/5, 1/2, 1, 2, 5 bis 10 facher Normalgeschwindigkeit variiert werden. Die IN- und OUT- Lampen blinken.

- Um ein störungsfreies Bild zu erhalten, stellen Sie den DT SELECT-Wähler auf SEARCH oder VAR. (Siehe dazu „Wiedergabe mit dynamischer spurlage“ auf Seite 1-83.)
- Dreht man den Knopf bis zum Klicken, so geht das Gerät in den Schnellvorlauf über (x10). Beim Übergang des Geräts in den Schnellvorlaufbetrieb setzt das Bild aus oder es ist kurzzeitig gestört.

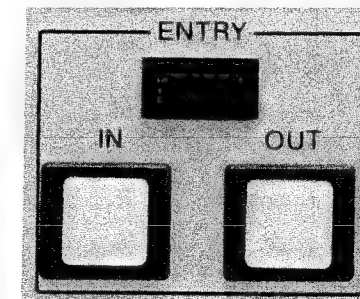
- 4 Lokalisieren Sie den ungefähren Beginn der aufzunehmenden Szene, indem Sie den an der Wiedergabemaschine angeschlossenen Monitor beobachten. Drücken Sie an dieser Stelle den Suchlauf-Knopf hinein.

Es erscheint das Standbild dieser Stelle. Der Suchlaufknopf bleibt gedrückt, und das Wiedergabegerät befindet sich im Jog-Betrieb. Die JOG- Lampe leuchtet auf.

- 5 Drehen Sie den Suchlauf-Knopf im Jog-Betrieb nach rechts oder nach links, bis der gewünschte Schnittanfangspunkt auf dem Monitor erscheint.

Im Jog-Betrieb hängt die Richtung und Geschwindigkeit des Bandtransportes davon ab, wie schnell und in welche Richtung der Suchlauf-Knopf gedreht wird. Wird der Suchlauf-Knopf nicht gedreht, erhält man einen Standbild.

- 6 Drücken Sie gleichzeitig die IN- und die ENTRY-Taste.



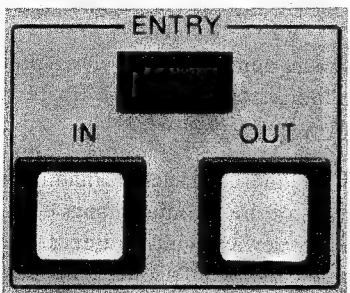
Der Zählerstand dieses Punktes wird als Schnittanfangspunkt abgespeichert. Die IN-Lampe leuchtet auf. Der erste Schnittanfangspunkt sollte mindestens 10 Sekunden vom Bandanfang entfernt liegen (bzw. 5 Sekunden vom Bandanfang, wenn der Vorlaufzeit-Schalter auf OFF steht).

Soll ein anderer Schnittanfangspunkt eingegeben werden, so lokalisieren Sie den neuen Punkt, und drücken Sie gleichzeitig die IN- und die ENTRY-Taste.

Der Schnittanfangspunkt kann nicht nur in der Stop- und Standbildfunktion, sondern auch in der Wiedergabe-, Suchlauf-, Schnellvorlauf- und Rücklauffunktion eingegeben werden.




## **SCHNITTENDPUNKT DER WIEDERGABEMASCHINE**

<p>1 Lokalisieren Sie den gewünschten Schnittpunkt in der gleichen Weise wie den Schnittpunkt.</p>	<p>(Führen Sie die Schritte 1 bis 5 der vorhergehenden Seite aus.)</p>
<p>2 Drücken Sie gleichzeitig die OUT- und die ENTRY-Taste.</p> 	<p>Die OUT-Lampe leuchtet auf.</p> <p>Der Zählerstand dieses Punktes wird als Schnittpunkt abgespeichert.</p> <ul style="list-style-type: none"> <li>Werden die gleichen Punkte als Schnittpunkt- und Schnittpunkt eingegeben oder wird der Schnittpunkt vor dem Schnittpunkt eingegeben, so wird der Schnittpunkt gelöscht. Achten Sie auf die richtige Eingabe des Schnittpunkt- und Schnittpunktes.</li> </ul>

- Der Schnittpunkt kann entweder in die Wiedergabemaschine oder in die Aufnahmemaschine eingegeben werden.

## **SCHNITTANFANGSPUNKT DER AUFNAHMEMASCHINE**

<p>1 Drücken Sie die RECORDER-Taste.</p> 	<p>Die RECORDER-Anzeige leuchtet auf.</p>
<p>2 Lokalisieren Sie den Bandpunkt, von dem ab die Szene aufgenommen werden soll in gleicher Weise wie den Schnittpunkt der Wiedergabemaschine.</p>	<p>Die IN-Lampe blinkt.</p>
<p>3 Drücken Sie gleichzeitig die IN- und die ENTRY-Taste.</p>	<p>Die IN-Lampe leuchtet.</p> <p>Der Zählerstand dieses Punktes wird als Schnittpunkt abgespeichert.</p> <p>Der erste Schnittpunkt sollte mindestens 10 Sekunden vom Bandanfang entfernt liegen (bzw. 5 Sekunden vom Bandanfang, wenn der Vorlaufzeit-Schalter auf OFF steht).</p>

## **SCHNITTENDPUNKT DER AUFNAHMEMASCHINE**

Gehen Sie zur Eingabe des Schnittpunktes der Aufnahmemaschine folgendermaßen vor:

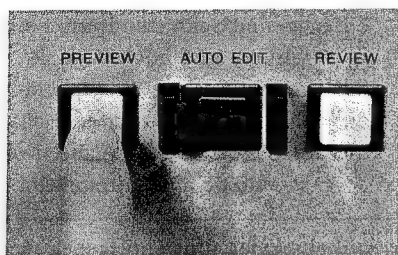
- Lokalisieren Sie den Endpunkt der Aufnahme in gleicher Weise wie den Schnittpunkt der Wiedergabemaschine.
- Drücken Sie gleichzeitig die OUT- und die ENTRY-Taste.

Der Zählerstand dieses Punktes wird als Schnittpunkt abgespeichert.



#### 4. PROBEVORSCHAU DES SCHNITTVORGANGES (PREVIEW)

Sind die Schnittanfangs- und Schnittpunkte einmal festgelegt, so kann durch Drücken der PREVIEW-Taste eine Probevorschau des Schnittvorgangs vorgenommen werden.



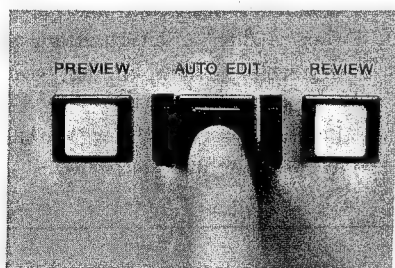
- ① Drücken Sie nach dem Festlegen der Schnittanfangs- und Schnittpunkte die PREVIEW-Taste. Die PREVIEW-Lampe leuchtet.
- ② Beobachten Sie den Monitor der Aufnahmemaschine. Überprüfen Sie, ob die Schnittanfangs- und Schnittpunkte richtig gewählt sind und ob die Qualität des aufzuzeichnenden Bildes zufriedenstellend ist.
- ③ Ändern Sie falls notwendig die Schnittanfangs- und Schnittpunkte, und überprüfen Sie die Szene erneut durch Drücken der PREVIEW-Taste.

Drücken Sie zum Anhalten des Bandes während der Probevorschau die STOP-Taste. Soll die automatische Schnittaufnahme während der Probevorschau beginnen, so drücken Sie die AUTO EDIT-Taste.

#### 5. STARTEN DER SCHNITTAUFNAHME

Drücken Sie die AUTO EDIT-Taste.

Die Aufnahme wird automatisch ausgeführt.



- Die automatische Schnittaufnahme kann während der Probevorschau gestartet werden; sie kann jedoch auch direkt ohne vorherige Probevorschau gestartet werden.



### Nach beendeter Schnittaufnahme

Ist das Aufnehmen einer Szene (vom Schnittanfangs- bis zum Schnittpunkt) beendet, so suchen Sie die Schnittanfangs- und Schnittpunkte der nächsten Szene, wie auf den vorhergehenden Seiten beschrieben, auf. Der Schnittpunkt einer Szene kann auch zum Schnittanfangspunkt der nächsten Aufnahme gewählt werden. Siehe dazu Seite 1-99.

### Bildüberwachung während der Schnittaufnahme

Während der Schnittaufnahme kann das zwischen 10 Sekunden (bzw. 5 Sekunden) vor dem Schnittanfangspunkt und 2 Sekunden nach dem Schnittpunkt liegende Material auf dem an die Aufnahmemaschine angeschlossenen Monitor überwacht werden.

Steht der PB/PB/EE-Wähler bei der Schnittaufnahme auf PB, so ist gleichzeitig das Wiedergabebild zu sehen.

Fehlt beim Einfügbetrieb ein Teil des CTL-Signals auf dem Band der Aufnahmemaschine oder ist ein Teil nicht synchronisiert, so erscheint das Wiedergabebild der Aufnahmemaschine auf dem Monitor und die Schnittaufnahme wird an diesem Teil nicht durchgeführt.

### Stop während der Schnittaufnahme

Zum Stoppen der Aufnahme vor Erreichen des Schnittpunktes drücken Sie gleichzeitig die OUT- und die ENTRY-Taste.

### Bandschutzautomatik

Wird das Gerät im Suchlaufbetrieb länger als 8 Minuten angehalten, so bewegt sich das Band mit 1/30 der Normalgeschwindigkeit in Vorwärtsrichtung weiter, um das Band zu schützen. Der abgespeicherte Schnittpunkt bleibt erhalten.

### Ändern der Vorlaufzeit

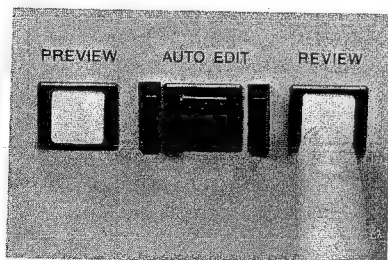
Falls notwendig kann die Vorlaufzeit auf 5 Sekunden geändert werden. Die Vorlaufzeit der Wiedergabe- und der Aufnahmemaschine weist den an der Aufnahmemaschine eingestellten Wert auf.

### Einstellung der Schnittgenauigkeit

Die Schnittgenauigkeit ist werkseitig auf  $\pm$  ein Einzelbild eingestellt. Ist eine Neueinstellung erforderlich, so schlagen Sie im Teil 2 und den folgenden Teilen nach.

## 6. ÜBERPRÜFUNG DER SCHNITTAUFNAHME (REVIEW)

Ist eine Szene vom Schnittanfangs- bis zum Schnittpunkt aufgezeichnet, so kann das Schnittergebnis durch Drücken der REVIEW-Taste überprüft werden.

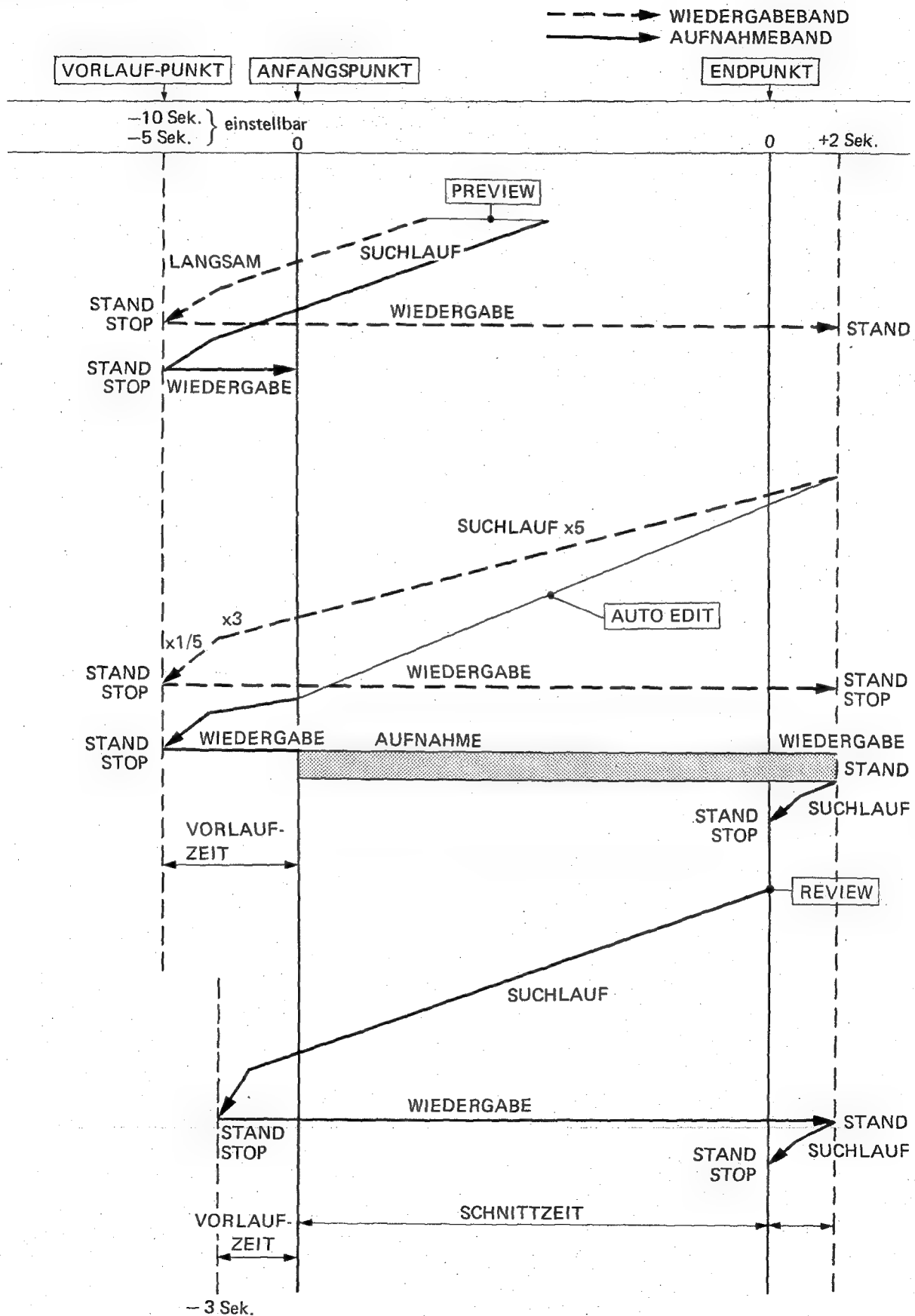


- ① Drücken Sie nach beendeter Aufnahme die REVIEW-Taste.  
Die REVIEW-Lampe leuchtet auf.  
Nur das Band der Aufnahmemaschine bewegt sich.
- ② Überprüfen Sie die Qualität der Schnittaufnahme auf dem Monitor der Aufnahmemaschine.  
Drücken Sie zum Anhalten des Bandes während der Überprüfung der Schnittaufnahme die STOP-Taste.



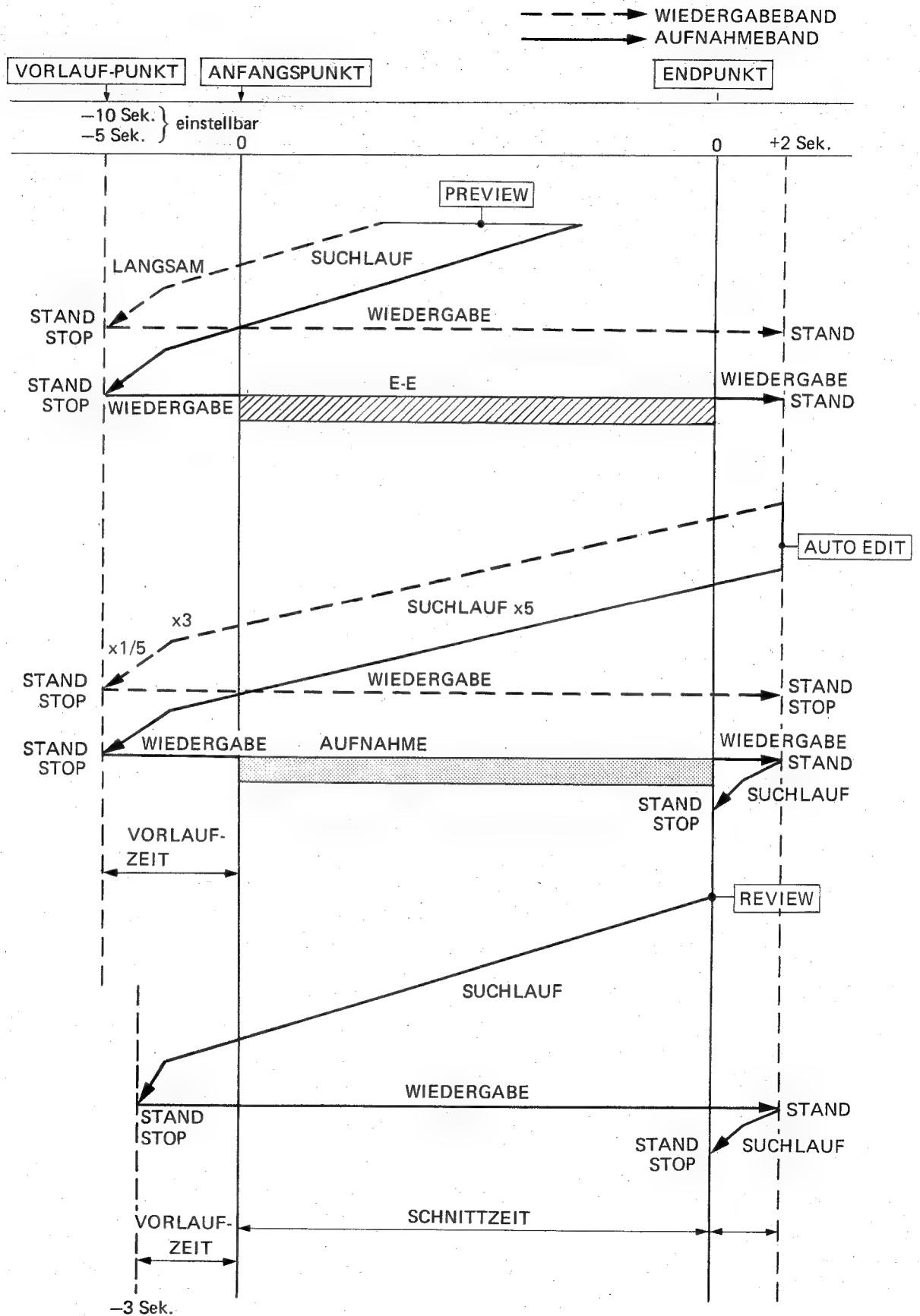
# BANDBEWEGUNG ANFÜGBETRIEB

BETRIEB





# EINFÜGBETRIEB





## ZEITZÄHLER (BANDZÄHLER)



Der Zeitzähler zählt die auf dem Band aufgezeichneten CTL-Signale, und die auf der Anzeige erscheinenden Zahlen zeigen bei Normalgeschwindigkeit die bereits durchgelaufene Bandmenge in Stunden, Minuten, Sekunden und Einzelbildern an. Die Anzeige ändert sich mit dem Bandlauf.

- Ist kein CTL-Signal aufgezeichnet, so kann der Zähler die Zeit nicht zählen. Deshalb kommt es bei einem unbespielten Band zu einer fehlerhaften Anzeige.
- Wird der BK-806 Zeitcode-Generator/Leser (Sonderzubehör) verwendet, so wird auch der Zeitcode gezählt.

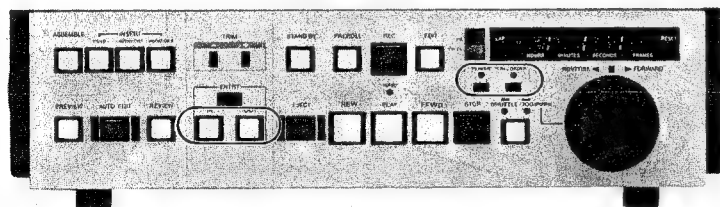
#### Rückstellung des Zeitzählers auf „0:00:00:00“

Drücken Sie die RESET-Taste.

- Läuft das Band vom „0:00:00:00“-Punkt aus rückwärts, so erscheint links vor der Zahlenanzeige das Zeichen „-“.
- Zum leichteren Auffinden der Schnittpunkte empfiehlt es sich mit Hilfe der Zeitzähleranzeige eine Liste des Bandinhalts anzulegen.

#### Überprüfung der Schnitthanfans- und Schnittendpunkte mit Hilfe des Zeitzählers

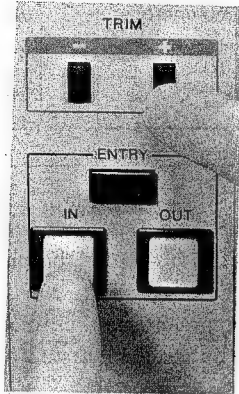
Ist die PLAYER-Taste gedrückt, so zeigt der Zeitzähler beim Drücken der IN- oder OUT-Taste die Schnitthanfans- bzw. Schnittendpunkte der Wiedergabemaschine an; ist die RECORDER-Taste gedrückt, so zeigt er die entsprechenden Punkte der Aufnahmemaschine an.



Die Anzeige erfolgt nur solange die entsprechende Taste gedrückt wird.



## Feineinstellung des Schnittpunktes (TRIM)

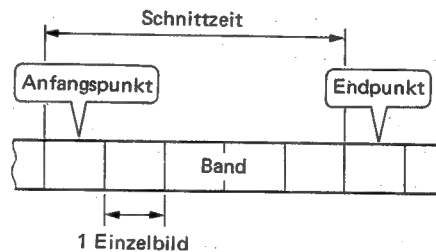


- ① Drücken Sie die IN- und OUT-Taste, und lassen Sie sie während Schritt ② gedrückt.
- Auf der Anzeige erscheint die Einzelbildnummer des Schnittanfangs- und des Schnittendpunktes.
- ② Drücken Sie zum Vorrücken des Schnittpunktes um ein Einzelbild die TRIM + -Taste und zum Rücksetzen des Schnittpunktes um ein Einzelbild die TRIM - -Taste kurzzeitig.

Drücken Sie die + oder - -Taste mehrmals kurzzeitig, bis die gewünschte Einzelbildnummer erscheint.

Der Schnittpunkt kann auch durch Eingeben eines neuen Punktes geändert werden.

## Drücken der LAP-Taste



Die Schnittzeit wird vom Zeitzähler angezeigt.

Eingegebene Schnittpunkte	Die Zeitzähleranzeige zeigt Folgendes an:
Schnittanfangs- und Schnittendpunkte sind eingegeben.	Zeit vom Schnittanfangs- zum Schnittendpunkt.
Nur der Schnittanfangspunkt ist eingegeben.	Zeit vom Schnittanfangspunkt bis zum Punkt, an dem die Taste gedrückt wurde.
Nur der Schnittendpunkt ist eingegeben.	Zeit der vorhergehenden Schnittszene.
Schnittanfangs- und Schnittendpunkte sind nicht eingegeben.	Zeit der vorhergehenden Schnittszene.

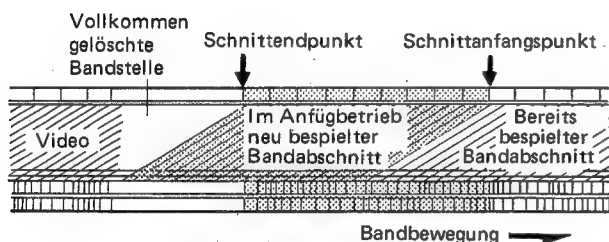


## EINFÜGSCHNITTE

Bei Einfügbetrieb werden sämtliche Signale – Video, Tonsignal-1, Tonsignal-2 und CTL-Signale – gleichzeitig auf Band aufgezeichnet. Zuerst werden die Video-, Ton- und CTL-Signale von Szene A und anschließend die Video-, Ton- und CTL-Signale von Szene B, Szene C usw. aufgezeichnet.



Der Anfügbetrieb dient zur gleichzeitigen Aufzeichnung von Video- und Tonsignal auf ein unbespieltes Band. Die Aufnahmeteile schließen rückseitig lückenlos ab. Wenn eine neue Szene auf ein bereits bespieltes Band im Anfügbetrieb aufgenommen wird, entsteht am Schnittpunkt eine vollkommen gelöschte Bandstelle, so daß das Bild an dieser Stelle instabil wird. Verwenden Sie deshalb zum Einfügen von neuen Szenen auf bereits bespielte Bänder den Einfügbetrieb.



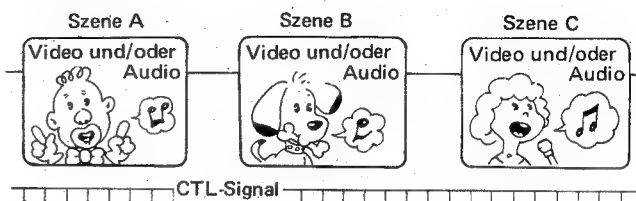
## AUFNAHME AUF EIN NEUES BAND IM ANFÜGBETRIEB

Eine vorhergehende Aufzeichnung des CTL-Signals ist nicht notwendig; soll die Anfügaufnahme jedoch vom Anfang eines neuen Bandes oder nach einer gelöschten Bandstelle vorgenommen werden, muß mindestens 10 Sekunden (bzw. 5 Sekunden, wenn der Vorlaufzeit-Schalter auf OFF steht) vor dem ersten Schnittpunkt ein CTL-Signal aufgezeichnet sein.

Statt ein CTL-Signal aufzunehmen, kann man auch einfach im Aufnahmebetrieb ein Band kopieren.

## EINFÜGSCHNITTE

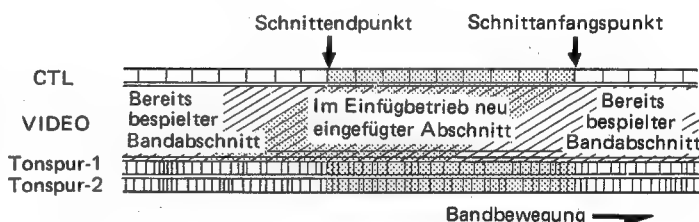
Bei Einfügbetrieb muß das CTL-Signal bereits auf dem Band aufgezeichnet sein. Neue Video- und/oder Tonsignale werden synchron zu diesem CTL-Signal aufgenommen.



Einfügbetrieb ist das geeignete Verfahren, wenn Sie –

- exakte Schnitte auf ein bereits bespieltes Band durchführen wollen.
- Musik bzw. einen Kommentar auf ein Band, auf das bereits Videosignale aufgezeichnet sind, aufnehmen wollen.
- Videosignale auf ein Band, auf das bereits Tonsignale aufgezeichnet sind, aufnehmen wollen.
- Video- und/oder Tonsignale auf ein Band, das im Anfügbetrieb redigiert worden ist, neu aufzeichnen wollen.

Bei Einfügbetrieb ist es möglich, eine neue Szene in eine bereits vorhandene Aufnahme einzufügen. Das Bild am Schnitt-Endpunkt ist stabil.



## AUFNAHME AUF EIN NEUES BAND IM EINFÜGBETRIEB

Das CTL-Signal muß durchgehend mindestens 10 Sekunden (bzw. 5 Sekunden, wenn der Vorlaufzeit-Schalter auf OFF steht) vor und nach der zu bespielende Stelle aufgezeichnet sein.

Zum Aufnehmen des CTL-Signals:

- Schließen Sie eine Video-Kamera an, und nehmen Sie das Ausgangssignal durchgehend auf.
- Schließen Sie einen normalen Videosignalgenerator an, und nehmen Sie das Ausgangssignal durchgehend auf.



## BLINKEN DER KONTROLLAMPEN

Drücken Sie die Tasten, über denen die Kontrollampen blinken, um den Schnittvorgang abzuschließen. Das Aufleuchten und Blinken der Kontrollampen hat folgende Bedeutung.

- Das Blinken der ASSEMBLE- und INSERT (VIDEO, AUDIO CH1, AUDIO CH2)-Lampen zeigt an, daß der Schnittbetrieb durch Drücken der entsprechende Taste festgelegt werden muß.

Das Leuchten mehrerer Lampen oder einer Lampe zeigt an, daß der Schnittbetrieb festgelegt ist.

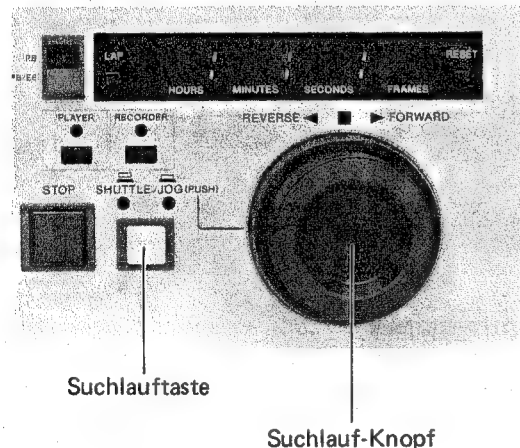
- Das Blinken der IN- und/oder OUT-Lampe(n) an der Wiedergabe- und Aufnahmemaschine zeigt an, daß der (die) Schnittpunkt(e) eingegeben werden muß (müssen).

Das Leuchten der IN- und OUT-Lampen zeigt an, daß die Schnittanfangs- und Schnittpunkte festgelegt sind, aber die Schnittaufnahme noch nicht durchgeführt wurde.

- Das Blinken der PREVIEW- und AUTO EDIT-Lampe zeigt an, daß der Vorschaubetrieb oder der automatische Schnittbetrieb durchgeführt werden kann.

Das Leuchten der PREVIEW- oder AUTO EDIT-Lampe zeigt an, daß sich die Aufnahmemaschine im entsprechenden Betriebszustand befindet.

## VERWENDUNG DES SUCHLAUF-KNOPFES



### Verwendungsart 1: Direkte Überführung des Geräts in den Shuttle-Betrieb mit der am Suchlauf-Knopf eingestellten Geschwindigkeit

- 1 Stellen Sie den Suchlauf-Knopf in die gewünschte Stellung im Shuttle-Betrieb (z.B. auf 5 fache Normalgeschwindigkeit in Vorwärtsrichtung).
- 2 Drücken Sie die PLAY-Taste.  
Der Recorder geht in den Wiedergabebetrieb über.
- 3 Drücken Sie die Suchlauftaste.  
Das Gerät geht direkt in den Shuttle-Betrieb mit 5 facher Normalgeschwindigkeit in Vorwärtsrichtung über.

### Verwendungsart 2: Verhinderung von ungewolltem Übergang in den Suchlaufbetrieb

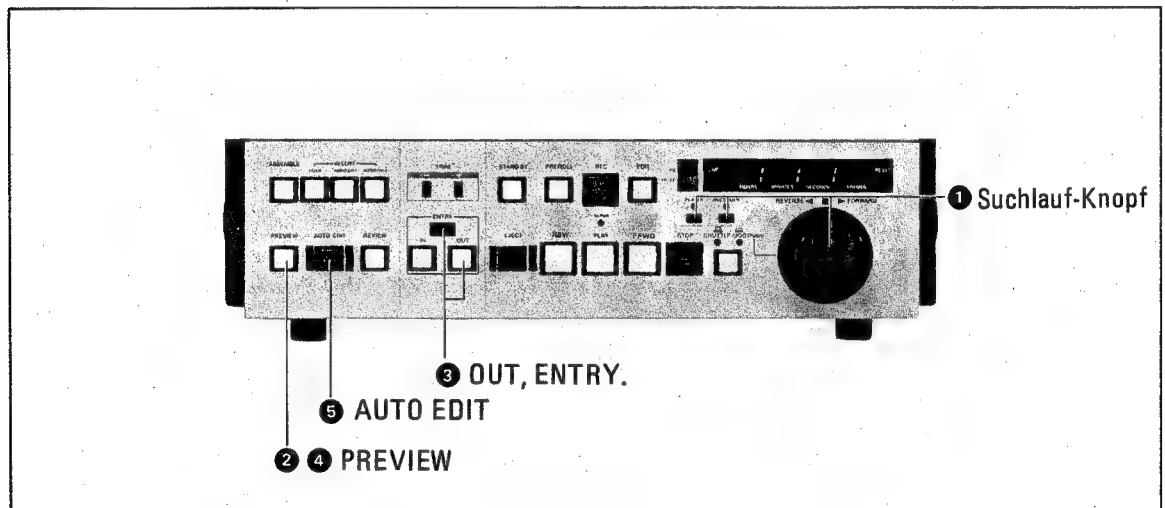
Wird der Suchlauf-Knopf während des Betriebs versehentlich berührt, geht das Gerät in den Suchlaufbetrieb über. Um dies zu verhindern, stellen Sie den auf der Platine SY-37 angebrachten Schalter S4 auf OFF. Der Suchlauf-Knopf ist dann nur betriebsbereit, wenn die Suchlauftaste gedrückt wird. Genauere Information hierzu finden Sie im Teil 2.



## SCHNELLES SCHNEIDEN

Sie können Zeit sparen, indem Sie die Schnitthanfangs- und Schnittpunkte im Vorschaubetrieb eingeben.

- ① Suchen Sie den Schnitthanfangs- und den Schnittpunkt mit dem Suchlauf-Knopf sowohl für die Wiedergabe- als auch für die Aufnahmemaschine auf. Stellen Sie ein Standbild ein.
- ② Drücken Sie die PREVIEW-Taste.  
Die im Schritt ① eingestellten Punkte werden als Schnitthanfangs- und Schnittpunkt der Aufnahme- und der Wiedergabemaschine abgespeichert. Der Vorschaubetrieb beginnt.  
Die IN-Lampen leuchten.
- ③ Beobachten Sie den Monitor der Aufnahmemaschine und drücken Sie am Endpunkt der Szene gleichzeitig die OUT- und die ENTRY-Tasten an der Wiedergabe- und an der Aufnahmemaschine.  
Der Wert des Zeitzählers wird dann als Schnittpunkt abgespeichert. Das Band hat dann noch eine Auslaufzeit von weiteren 2 Sekunden und kehrt dann zum Vorlauf-Punkt zurück.
  - Sie können den Punkt, an dem die Szene enden soll, auch mit dem Suchlauf-Knopf aufsuchen.
- ④ Falls notwendig führen Sie noch eine Vorschau durch.
- ⑤ Drücken Sie die AUTO EDIT-Taste.  
Die Schnittaufnahme beginnt dann.



### Noch schnelleres Schneiden

Auch ohne Eingabe von Anfangs- und Endpunkten können Schnitte gemacht werden.

- ① Suchen Sie den Schnitthanfangs- und den Schnittpunkt mit dem Suchlauf-Knopf an der Wiedergabe- und an der Aufnahmemaschine auf. Stellen Sie dann ein Standbild ein.
- ② Drücken Sie die AUTO EDIT-Taste.  
Dieser Punkt wird dann zum Schnitthanfangspunkt der Wiedergabe- und der Aufnahmemaschine.
- ③ Beobachten Sie den Monitor der Aufnahmemaschine, und drücken Sie an dem gewünschten Endpunkt der Szene gleichzeitig die OUT- und die ENTRY-Taste an der Wiedergabe- und an der Aufnahmemaschine. Dieser Punkt wird dann zum Schnittpunkt, an dem die Aufnahme endet.



## FORTLAUFENDES SCHNEIDEN (BUTT)

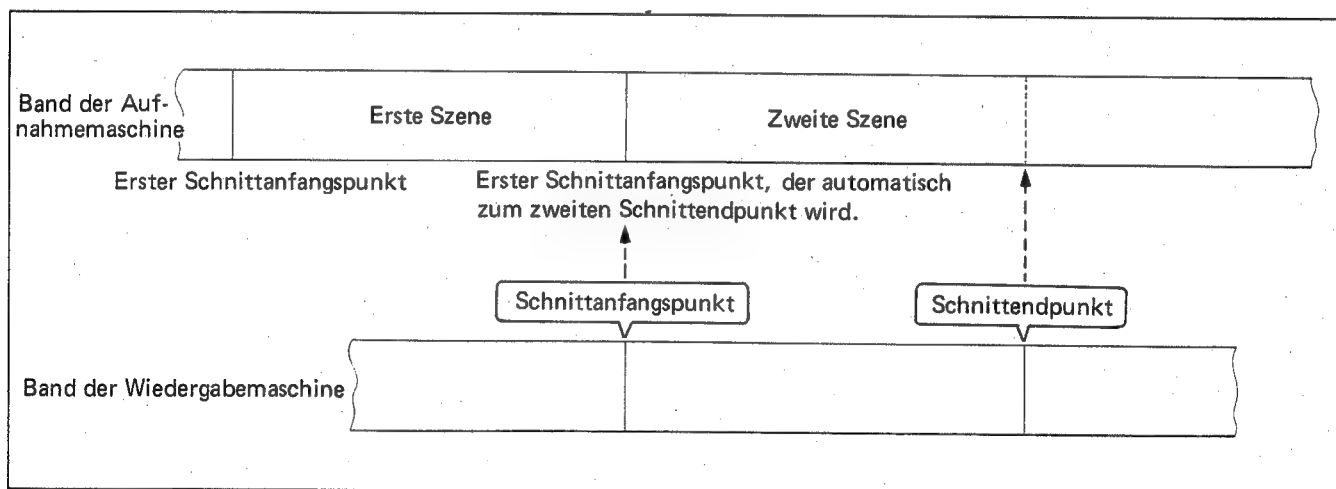
Nach einem Schnittvorgang kehrt der Recorder zum Schnittpunkt zurück und stoppt. Dieser Schnittpunkt kann zum nächsten Schnittanfangspunkt gemacht werden.

Diese Redigierungsart wird Butt-Betrieb genannt.

- 1 Suchen Sie die gewünschten Stellen auf, und geben Sie die nächsten Schnittanfangs- und Schnittpunkte für die Wiedergabemaschine ein.
- 2 Drücken Sie die AUTO EDIT-Taste.  
Der Schnittvorgang wird dann ausgeführt.

Sie können auch folgendermaßen vorgehen:

- 1 Suchen Sie die gewünschte Stelle, und geben Sie den nächsten Schnittanfangspunkt für die Wiedergabemaschine ein.
- 2 Drücken Sie die AUTO EDIT-Taste.  
Die Schnittvorgang beginnt dann.
- 3 Beobachten Sie den Monitor der Aufnahmemaschine, und drücken Sie an dem gewünschten Endpunkt der Szene gleichzeitig die OUT- und die ENTRY-Taste an der Wiedergabe- und an der Aufnahmemaschine. Dieser Punkt wird dann zum Schnittpunkt, an dem die Aufnahme endet.





## UNTERSCHIEDLICHE SCHNITTANFANGS- ODER SCHNITTENDPUNKTE FÜR VIDEO UND AUDIO (SPLIT-SCHNITT)

Bei Einfügbetrieb kann der Schnittvorgang der Videospur, der Tonspur-1 und der Tonspur-2 an verschiedenen Stellen gestoppt werden.

- ❶ Wählen Sie das gewünschte Eingangssignal durch Drücken einer oder aller INSERT-Tasten.
- ❷ Starten Sie den automatischen Schnittvorgang.
- ❸ Drücken Sie die entsprechende(n) INSERT-Taste(n) an der Stelle, an der der Schnittvorgang des Video- oder des Tonsignals gestoppt werden soll.  
Die entsprechende(n) Kontrollampe(n) geht (gehen) aus.  
Drücken Sie die entsprechende(n) INSERT-Taste(n) an der Stelle, an der der Schnittvorgang der Video- oder des Tonsignals begonnen werden soll.  
Die entsprechende(n) Kontrollampe(n) leuchtet (leuchten) auf.  
An jeder beliebigen Stelle kann (können) das (die) gewünschte(n) Signal(e) durch Drücken der entsprechenden INSERT-Taste(n) ein- bzw. ausgeblendet werden.  
Dies ist auch möglich, wenn gerade alle Signale ausgeblendet sind.
- ❹ Ist ein Schnittpunkt eingegeben, wird der Schnittvorgang automatisch gestoppt. Ist kein Schnittpunkt eingegeben, so drücken Sie zum Stoppen des Schnittvorgangs die ENTRY- und die OUT-Taste:  
Ist der Schnittvorgang einmal gestoppt, kann keine Einblendung des Video- oder des Tonsignals durch einfaches Drücken der INSERT-Tasten mehr vorgenommen werden.

Auch im manuellen Einfügschnitt-Betrieb kann der Split-Schnittvorgang in gleicher Weise durchgeführt werden. Drücken Sie dann zum Stoppen des Schnittvorgangs die PLAY-Taste.



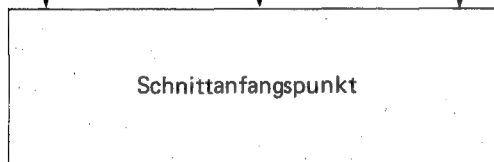
## Beispiel eines Split-Schnittvorgangs



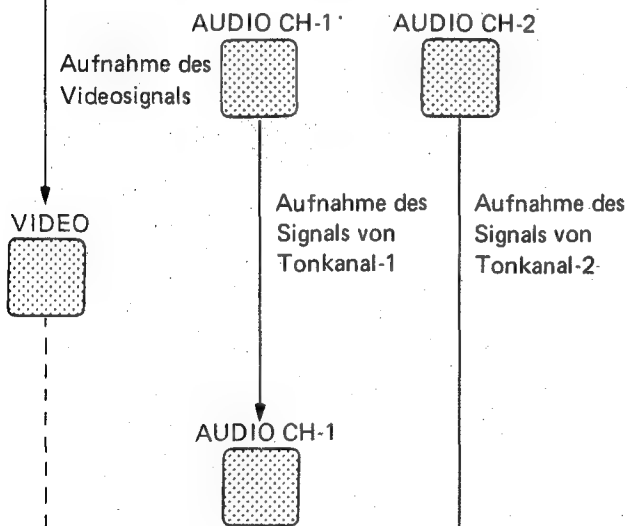
Diese Taste drücken.



Das Videosignal wird als Eingangssignal gewählt.



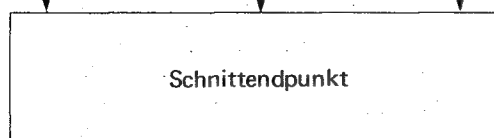
Zum Starten des Schnittvorgangs AUTO EDIT-Taste drücken.



Die Aufnahme des Signals von Tonkanal-1 und Tonkanal-2 beginnt.

Die Aufnahme des Videosignals endet.

Die Aufnahme des Signals von Tonkanal-1 endet.



Der Schnittvorgang ist beendet.

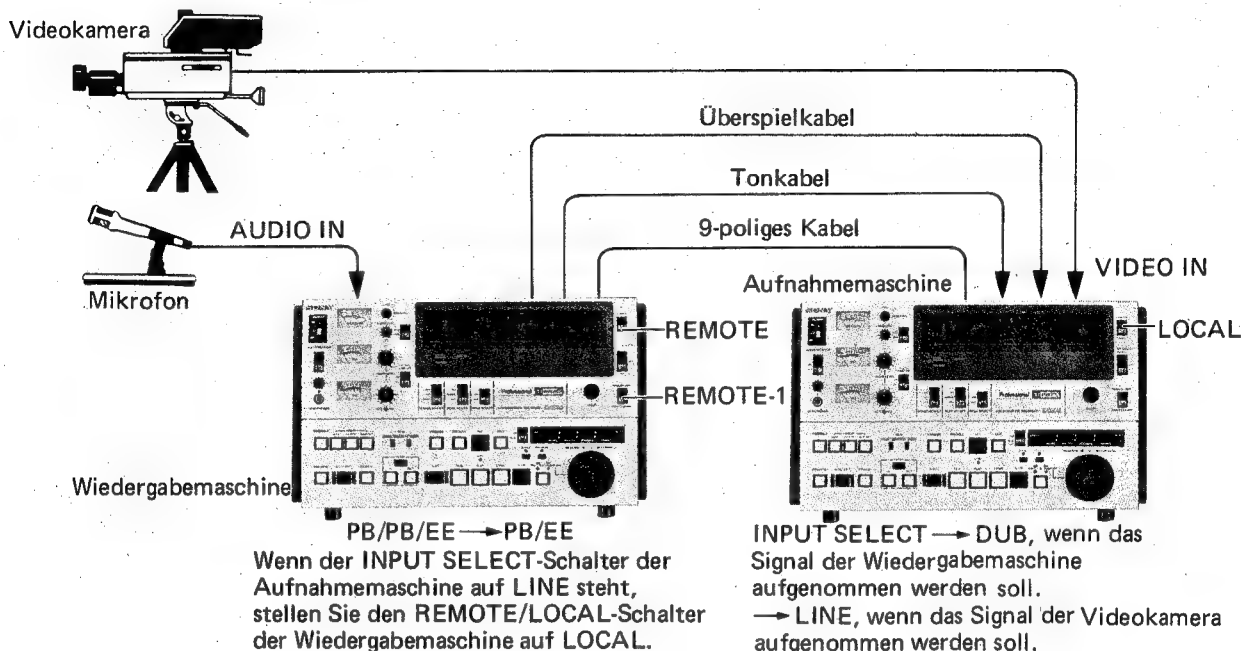


## SCHNEIDEN MIT EINEM SIGNAL VON EINER VIDEOKAMERA (LIVE-SCHNITT)

### Anschlüsse

Schneiden mit einem Videokamerasignal und einem Wiedergabemaschinensignal:

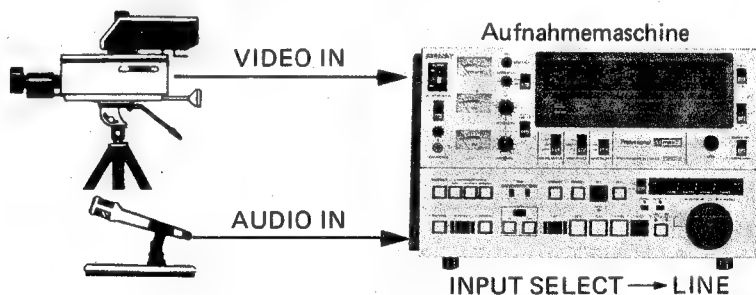
Stellen Sie die Anschlüsse her, wie in der Abbildung gezeigt.



- Wird das Signal der Videokamera aufgenommen, stellen Sie die Wiedergabemaschine auf STOP.

Schneiden nur mit einem Videokamerasignal:

Schließen Sie die Videokamera am VIDEO IN-Anschluß der Aufnahmemaschine an, und stellen Sie den INPUT SELECT-Wähler der Aufnahmemaschine auf LINE.



### Betrieb

- 1 Stellen Sie die Schnittbetriebsart ein: Anfüg- oder Einfügschnitt.

### Anfügschnitt

- 2 Geben Sie nur den Schnittpunkt der Aufnahmemaschine ein, und starten Sie den Schnittvorgang des Videokamerasignals durch Drücken der AUTO EDIT-Taste.
- 3 Drücken Sie zum Beenden des Schnittes gleichzeitig die ENTRY- und die OUT-Taste.

### Einfügschnitt

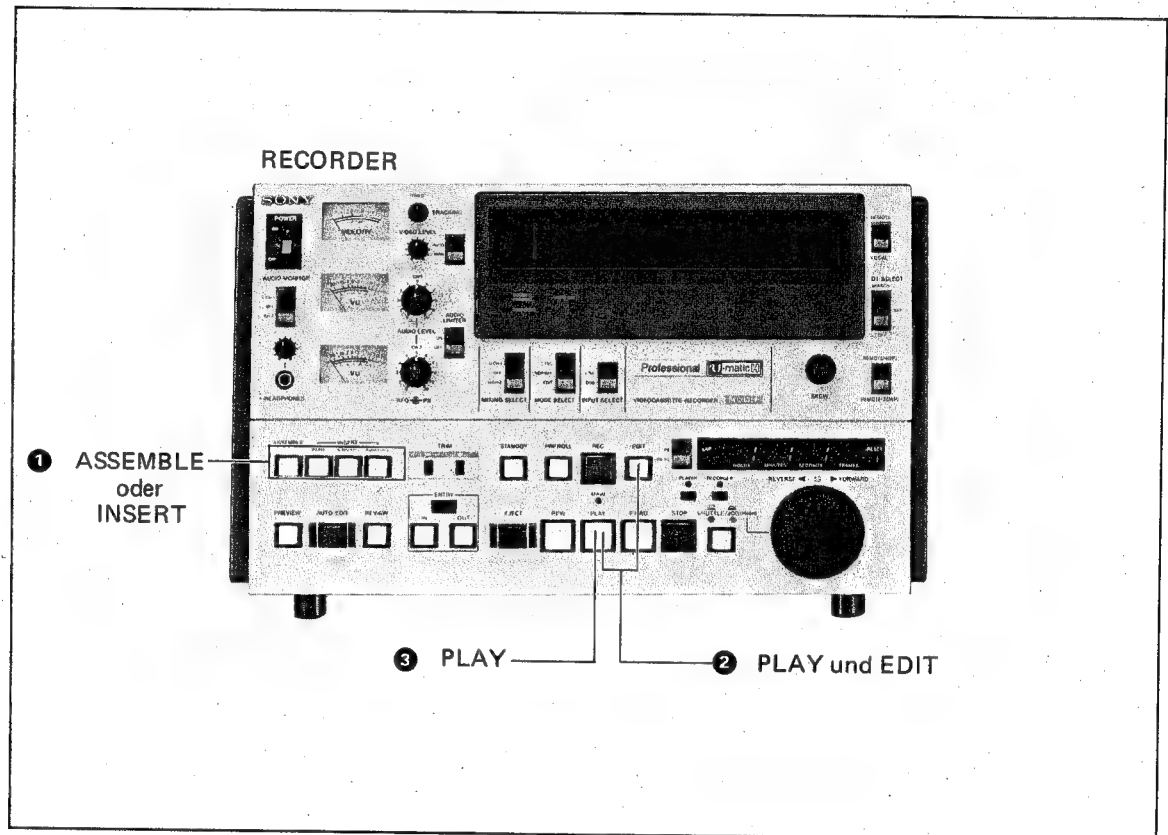
- 1 Geben Sie den Schnittpunkt und den Schnittpunkt der Aufnahmemaschine ein, und starten Sie den Schnittvorgang mit der AUTO EDIT-Taste. Sie können den Schnittvorgang auch starten, wenn nur der Schnittpunkt eingegeben ist. Drücken Sie in diesem Fall zum Stoppen des Schnittvorgangs gleichzeitig die ENTRY- und die OUT-Taste.
- Beim Anfügschnittbetrieb kann der Schnittpunkt nicht an der Aufnahmemaschine eingegeben werden.



## MANUELLES SCHNEIDEN

### BETRIEB

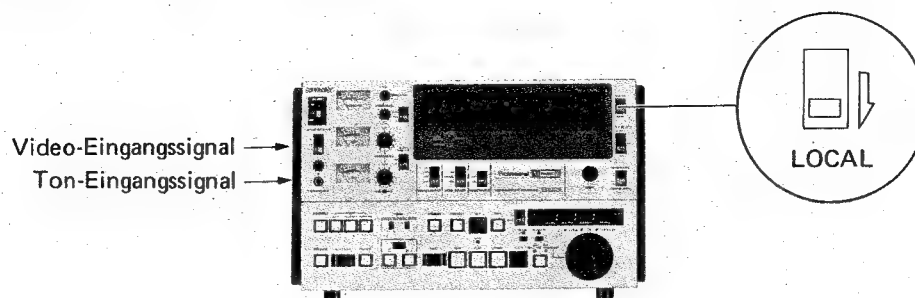
- ❶ Stellen Sie die Schnittbetriebsart ein: Anfüg- oder Einfügschnitt.
- ❷ Stellen Sie die Aufnahme- und die Wiedergabemaschine auf Wiedergabe und drücken Sie am gewünschten Schnittanfangspunkt gleichzeitig die PLAY- und die EDIT-Taste der Aufnahmemaschine.  
Der Schnittvorgang beginnt dann beim Drücken dieser Tasten.
- ❸ Drücken Sie an der gewünschten Schnittendstelle die PLAY-Taste der Aufnahmemaschine. Der Aufnahmebetrieb wird dann gestoppt, und die Aufnahmemaschine geht in den Wiedergabebetrieb über.  
Zum Anhalten des Bandes drücken Sie die STOP-Taste.



- Wenn der Schnitt aus der Stopstellung des Recorders heraus vorgenommen wurde, so ist das Bild am Schnittanfangspunkt instabil. Um ein vollkommen stabiles Wiedergabebild zu erhalten, muß die Wiedergabe mindestens 10 Sekunden vor dem Schnittanfangspunkt einsetzen.
- Steht der PB/PB/EE-Wähler bei der Schnittaufnahme auf PB, so ist gleichzeitig das Wiedergabebild zu sehen.
- Zum Betrieb der Wiedergabemaschine mit dynamischer Spurlage lesen Sie die Hinweise auf Seite 1-83 und 1-84 sorgfältig durch.



### 1-6-2. Schneiden unter Verwendung eines BVU-820P Video-Cassettenrecorders



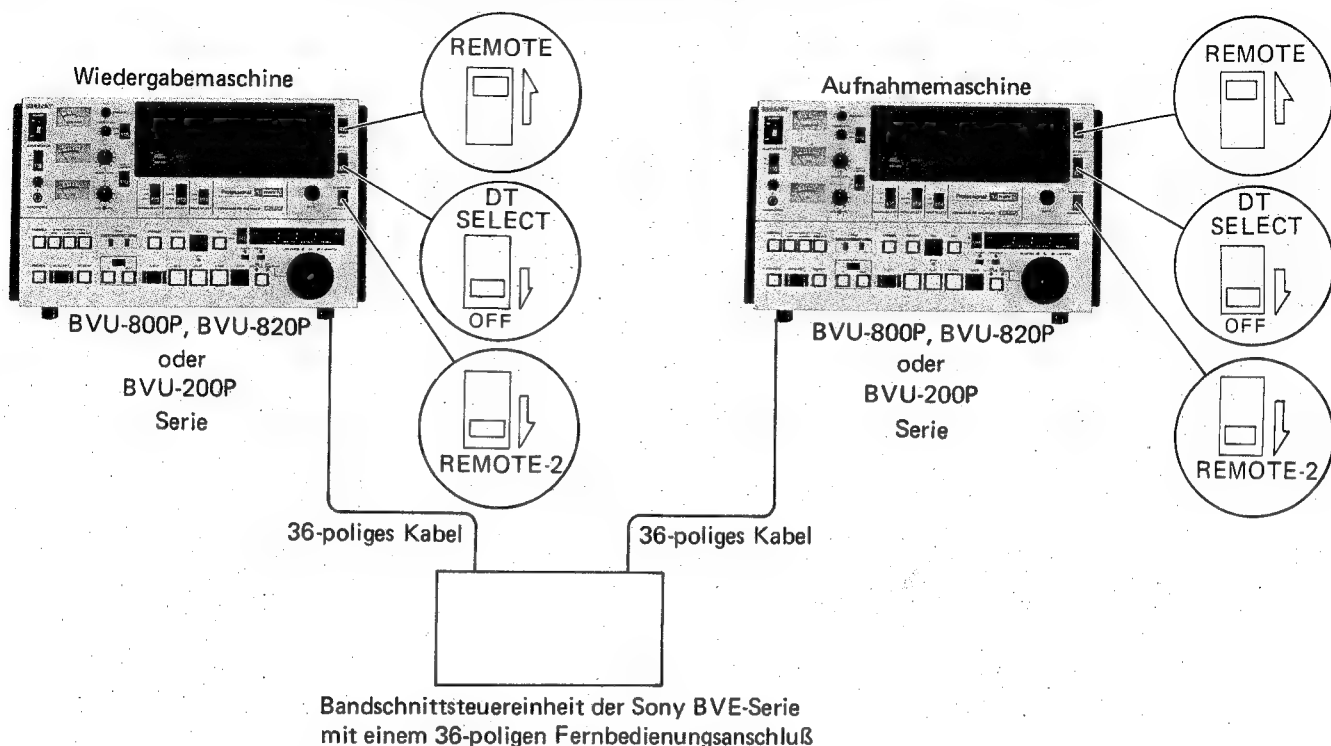
Es kann ein angeschlossenes Video- oder Ton-Eingangssignal wie auf den vorhergehenden Seiten beschrieben geschnitten werden.

**Hinweise:**

- Stellen Sie den REMOTE/LOCAL-Wähler auf LOCAL.
- Es können folgende Funktionen durchgeführt werden: Eingabe der Schnittanfangs- und Schnittpunkte, AUTO EDIT, PREVIEW und TRIM. Bedienen Sie die Video- und Toneingangssignalquellen getrennt.



### 1-6-3. Schneiden unter Verwendung einer herkömmlichen Steuereinheit



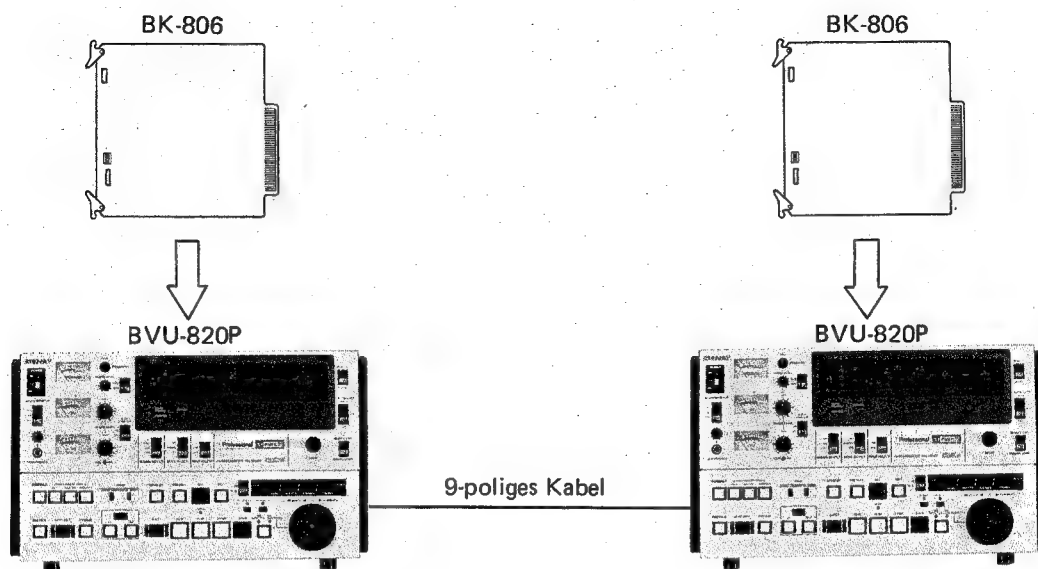
Verwenden Sie die Bedienungselemente der Steuereinheit, um die Aufnahme- und Wiedergabemaschine fernzubedienen.

- Falls vorhanden, stellen Sie den REMOTE/LOCAL-Wähler auf REMOTE.
- Stellen Sie den REMOTE-1 (9P)/REMOTE-2 (36P)-Wähler auf REMOTE-2 (36P).
- Stellen Sie zum Herausnehmen der Cassette den REMOTE/LOCAL-Wähler auf LOCAL, und drücken Sie die EJECT-Taste.  
Stellen Sie den Wähler zur Fernbedienung danach wieder auf REMOTE.
- Mit dem Suchlauf-Knopf der Geräte aus der BVE-500 Serie sind folgende Bandgeschwindigkeiten einstellbar: Steht der DT SELECT-Wähler auf SEARCH oder OFF, so ergibt sich in der Stellung x2 die Geschwindigkeit x5 und in der Stellung x1/20 die Geschwindigkeit x1/30. Steht der DT SELECT-Wähler auf VAR, so ergibt sich in der Stellung x-2 die Bandgeschwindigkeit x-1 und in der Stellung x+2 die Geschwindigkeit x+3. Achten Sie darauf, den DT SELECT-Wähler nach dem Schnittbetrieb wieder auf OFF zu stellen.
- Wird der BVU-820P durch Drücken einer Taste an einem Gerät der BVE-500 Serie vom Suchlauf- in einen anderen Betrieb umgeschaltet, so halten Sie die Taste so lange gedrückt, bis das Gerät richtig in den gewünschten Betriebszustand geschaltet hat.
- Wird an einem Gerät der BVE-500 Serie eine Taste gedrückt, so leuchtet eventuell die entsprechende Kontrollampe am BVU-820P nicht auf. Der korrekte Betriebszustand der Aufnahme- und Wiedergabemaschine wird in diesem Fall durch die Kontrollampen des BVE-500 angezeigt.
- Beim Anschluß einer Bandschnittsteuereinheit der BVE-500 Serie ist der COLOR FRAMING-Schalter des als Aufnahmemaschine geschalteten BVU-820P auf OFF zu stellen.
- Steht der Suchlauf-Knopf des angeschlossenen BVE-500ACE oder BVR-510ACE auf PAUSE, so erscheinen im Standbild selbst bei Wiedergabe mit dynamischer Spurlage evtl. Spurrasen-Störungen. Zur Vermeidung dieser Störungen ist eine Modifikation des BVE-500ACE oder des BVR-510ACE erforderlich. Ihr Sony Händler erteilt Ihnen gerne genauere Informationen.



#### 1-6-4. Zeitcode-Schnittbetrieb

##### BEI VERWENDUNG ZWEIER BVU-820P VIDEORECORDER



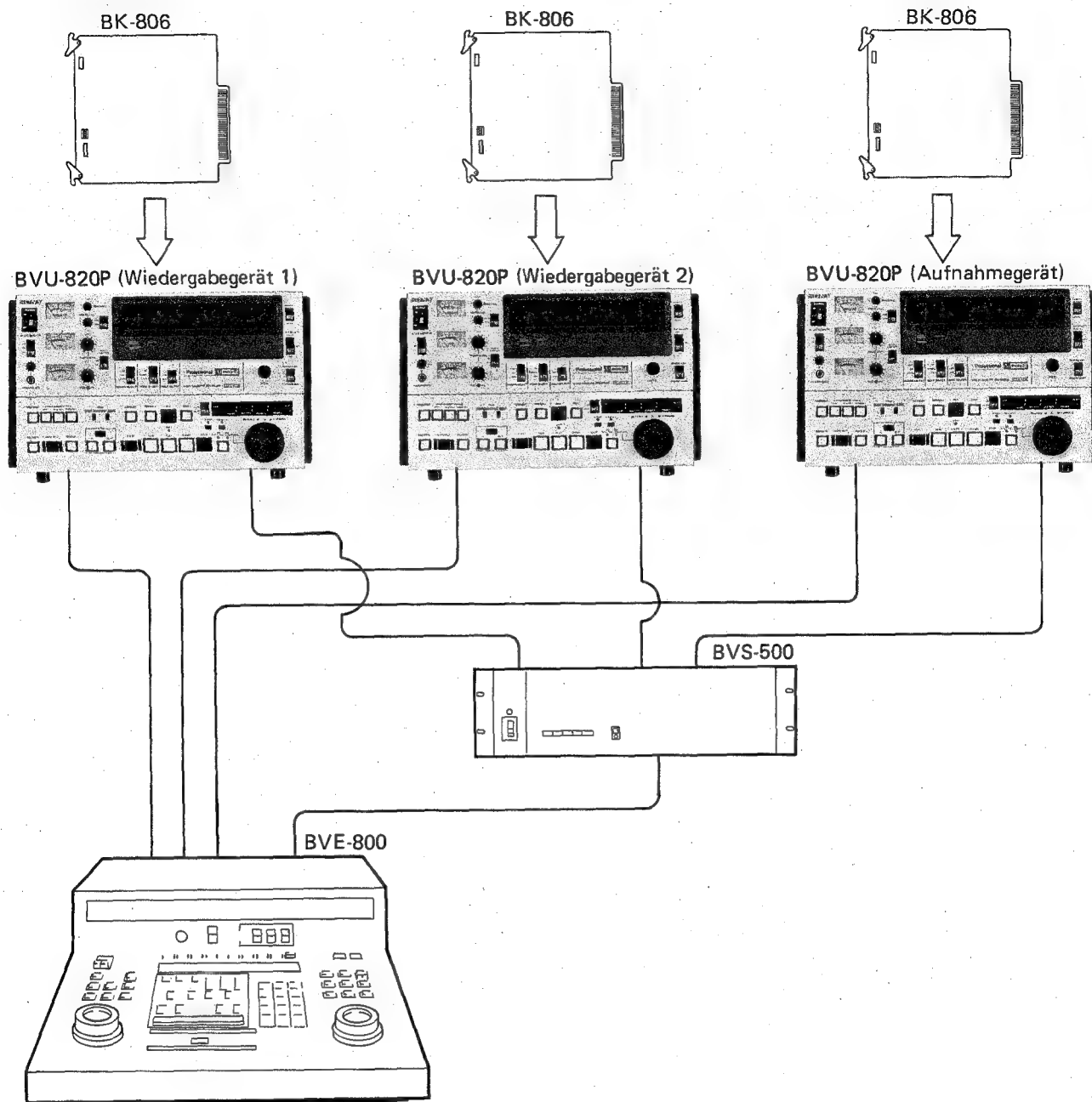
Wird die TC-13 Leiterplatte des BVU-820P gegen die Zeitcode-Generator/Leser-Leiterplatte BK-806 ausgetauscht, ist Aufnehmen und Wiedergeben des Zeitcodes sowie Zeitcode-Schnittbetrieb möglich.

Für den Schnittbetrieb brauchen die Zeitcode-Eingänge und Ausgänge nicht angeschlossen zu werden.

Genauere Informationen finden Sie in der Bedienungsanleitung der BK-806.



## VERWENDUNG DER BVE-800 UND DES BVS-500



BETRIEB

Wird die automatische Schnitt-Steuereinheit BVE-800 zusammen mit dem Video/Audio-Umschalter BVS-500 verwendet, so sind folgende Funktionen möglich.

- a) A/B Roll-Schnittbetrieb (drei Videorecorder werden gesteuert)
- b) Automatischer separater Tonschnitt
- c) Automatischer Schnittbetrieb mit dem Merfachschnitt-Speicher
- d) Automatischer Suchlauf
- e) Ausgabe der Schnittlisten auf Lochstreifen eines Fernschreibers
- f) Berechnung der Programmlänge
- g) Aufnahme und Wiedergabe von Cue-Signalen
- h) Aufnahme eines Zeitlupen- oder Standbildes (das Wiedergabebild-Signal unter Verwendung eines Time-Base-Correctors anschließen)

Genauere Informationen finden Sie in den Bedienungsanleitungen der BVE-800 und des BVS-500.



## 1-7. BANDSCHUTZAUTOMATIK

Um das Band vor einer eventuellen Beschädigung zu bewahren, geht das Gerät automatisch in die Stop- oder Cassettenauswurf-Funktion über, wenn während des Betriebs eine Abnormalität auftritt.

Einige Beispiele:

- Im Schnellvorlauf-, Rücklauf-, Vorlauf-, Stop- und Standbetrieb:  
Wird eine abnormale Spulendrehung oder Bandspannung festgestellt, so sorgt ein Kontrollsystem für einen Übergang in die Stop-Funktion des Geräts oder für ein Auswerfen der Cassette; ist die abnormale Spulendrehung oder Bandspannung nach 3 Sekunden immer noch vorhanden, so wird der Spulenmotor abgeschaltet, und gleichzeitig wird eine mechanische Bremse aktiviert.
- Beim Ein/Ausfädeln:  
Wird eine abnormale Spulendrehung oder Bandspannung festgestellt, so sorgt ein Kontrollsystem für einen Übergang in die Stop-Funktion oder für ein Auswerfen der Cassette.
- Falsche Spannung, kaputte LED  
Wird an der B+ Leitung eine falsche Spannung oder eine kaputte LED-Anzeige festgestellt, so sorgt ein Kontrollsystem für einen Übergang in die Stop-Funktion oder ein Auswerfen der Cassette.

## 1-8. REINIGUNG DER KÖPFE

Verwenden Sie zur Reinigung der Video- und Tonköpfe die Reinigungscassette KC-1C (Sonderzubehör). Das Reinigungsband wird in gleicher Weise wie das Videoband eingefädelt.

- 1) Legen Sie die Reinigungscassette ein, und drücken Sie sofort die PLAY-Taste.
  - 2) Lassen Sie das Band etwa 10 Sekunden laufen.
  - 3) Werfen Sie die Cassette sofort wieder aus.
- Da sich der Kopf auch in der Stop-Funktion dreht, kommt es zu einer übermäßigen Abnutzung der Köpfe, wenn die Cassette im Gerät gelassen wird.
  - Zur Reinigung der Köpfe ohne Verwendung der KC-1C Reinigungscassette siehe Teil 2 ff.



## 1-9. FUNKTIONSÜBERPRÜFUNGEN

Führen Sie die folgende Prüfabfolge durch, um alle Bedienungsfunktionen des BVU-820P zu überprüfen.

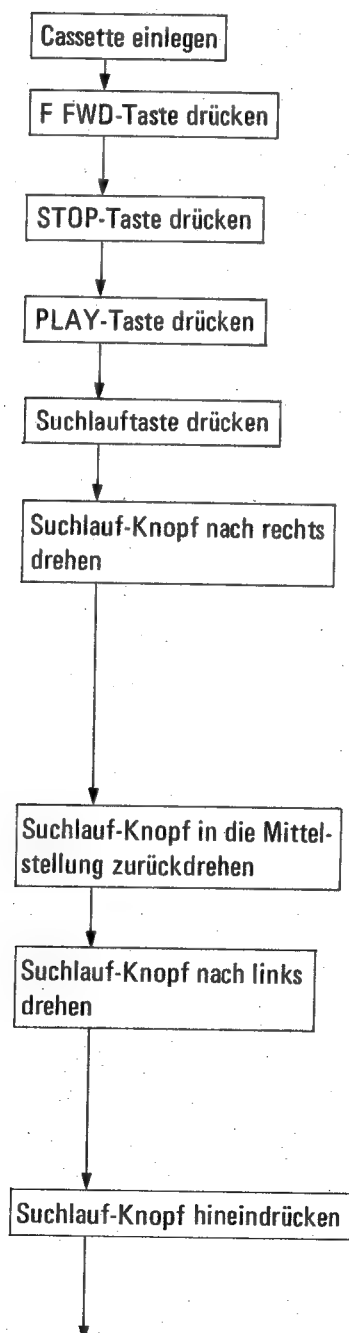
### Überprüfung des Wiedergabebetriebs

Schließen Sie zunächst einen Monitor sowie ein Gerät zur Kontrolle des Tonsignals an, und bereiten Sie eine Cassette vor, auf der ein Video-, ein Tonspur-1- und ein Tonspur-2-Signal aufgezeichnet ist.

#### Stellung der Wähler

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : OFF

#### Auszuführender Bedienungsschritt



#### Überprüfungspunkte

Erscheint ein Wiedergabebild hoher Geschwindigkeit und setzt das Video- und Tonsignal nicht aus?

Erscheint ein Standbild?

Erscheint das Wiedergabebild? Ist Tonsignal-1 und Tonsignal-2 hörbar?

Leuchtet die SEARCH-Lampe?

Wird die Wiedergabegeschwindigkeit schneller?

Geht das Gerät in den Schnellvorlauf (x10) über, wenn der Knopf bis zum Klicken gedreht wird? (Beim Übergang in den Schnellvorlauf fährt die Andruckrolle zurück, und die Bildwiedergabe wird unterbrochen oder einen Moment gestört.)

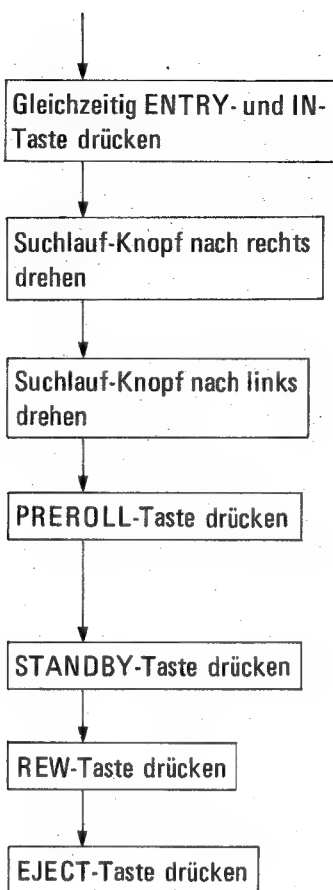
Leuchtet die SHUTTLE-Lampe?

Erscheint ein Standbild?

Erfolgt die Wiedergabe rückwärts? Erhöht sich die Wiedergabegeschwindigkeit, wenn der Knopf weite nach links gedreht wird? Geht das Gerät in den Rücklauf über (x10), wenn der Knopf bis zum Klicken gedreht wird?

Erscheint ein Standbild?  
 Leuchtet die JOG-Lampe?





Leuchtet die IN-Lampe?  
Notieren Sie den Zählerstand dieses Punktes (Schnittanfangspunkt).

Erscheint das Wiedergabebild in Vorwärtsrichtung im Jog-Betrieb?

Erscheint das Wiedergabebild in Rückwärtsrichtung im Jog-Betrieb?

Läuft das Band zu einem 10 Sekunden vor der Schnittanfangspunkt liegenden Punkt, und stoppt es dort?  
Erscheint dann ein Standbild?

Geht die STANDBY-Lampe aus?

Spult das Band zurück? Erscheint das E-zu-E-Bild? Stoppt das Band automatisch am Bandanfang?

Wird die Cassette ausgeworfen?

PB/PB/EE : PB/EE



## Überprüfung der Wiedergabe mit dynamischer Spurlage

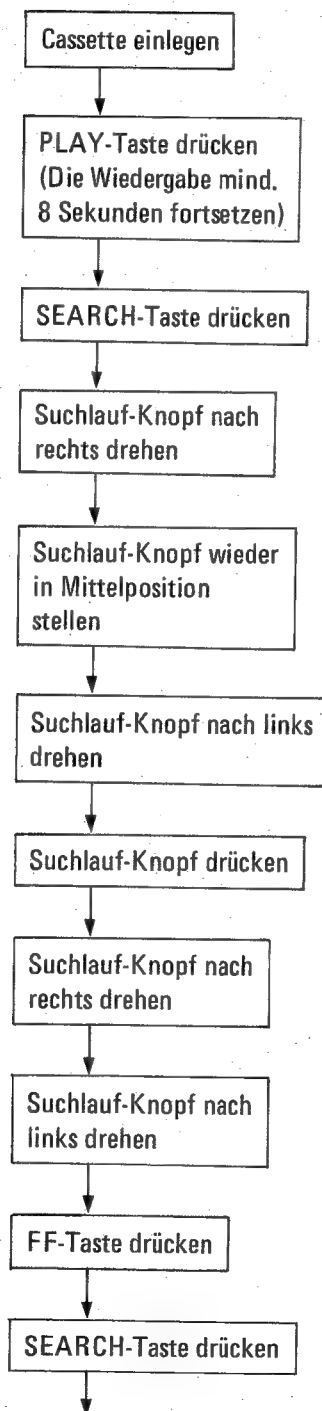
Schließen Sie zunächst einen Monitor und ein Gerät zur Kontrolle des Tonsignals an, und bereiten Sie eine Cassette vor, auf der ein Video-, ein Tonspur-1- und ein Tonspur-2-Signal aufgezeichnet ist.

- Verwenden Sie auf jeden Fall einen Time-Base-Corrector.

### Stellung der Wähler

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : VAR  
 MODE SELECT : TBC

### Auszuführender Bedienungsschritt



### Überprüfungspunkte

Erscheint das Wiedergabebild und ist der Ton von Tonspur-1 und -2 ist zu hören?

Leuchtet die SEARCH-Lampe?

Erscheint ein störungsfreies Bild in Vorwärtsrichtung im SHUTTLE-Betrieb?

Erscheint ein störungsfreies Standbild?

Erscheint ein störungsfreies Bild in Rückwärtsrichtung im SHUTTLE-Betrieb?

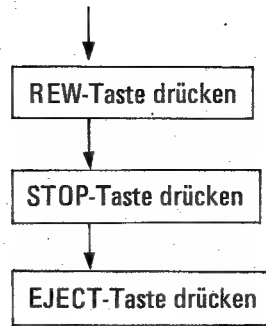
Erscheint ein störungsfreies Standbild im JOG-Betrieb?

Erscheint ein störungsfreies Bild in Vorwärtsrichtung im JOG-Betrieb?

Erscheint ein störungsfreies Bild in Rückwärtsrichtung im JOG-Betrieb?

Erscheint ein störungsfreies Standbild?





Erscheint ein gestörtes Standbild?

Wird die Cassette ausgeworfen?



## Überprüfung des Aufnahmebetriebs

### Vorbereitungen:

- Besorgen Sie eine unbespielte Cassette.
- Schließen Sie Signale an die VIDEO IN-, AUDIO IN CH-1 und CH-2-Anschlüsse an.
- Schließen Sie einen Monitor sowie ein Gerät zur Kontrolle des Tonsignals an.

### Stellung der Wähler

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 INPUT SELECT : LINE  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : OFF

### Auszuführender Bedienungsschritt



### Überprüfungspunkte

Beginnt der Aufnahmevorgang?

Erscheint ein E-zu-E-Bild?

Erscheint gleichzeitig ein Wiedergabebild?

Spult das Band zurück?  
 (Spulen Sie das Band bis zum Anfang zurück, und stoppen Sie es dort.)

Wird das aufgenommene Material wiedergegeben? Ist Tonsignal-1 und Tonsignal-2 hörbar?

Erscheint das E-zu-E-Bild, solange die REC-Taste gedrückt ist?

Leuchten die VIDEO-, AUDIO CH-1- und AUDIO CH-2-Lampen?

Beginnt die manuelle Schnittaufnahme?

Endet die Schnittaufnahme und läuft das Band aber noch im Wiedergabebetrieb weiter?

Erscheint ein Standbild?

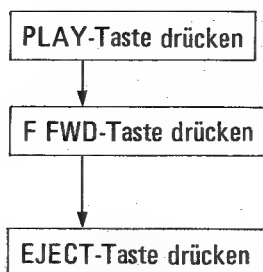
Erscheint das an den INSERT-Tasten gewählte E-zu-E-Bild- und Tonsignal?

Verschwindet das E-zu-E-Bild- und Tonsignal, und erscheint ein Standbild?

Spult das Band zurück? (Spulen Sie das Band bis zum Anfang der Schnittaufnahme zurück, und stoppen Sie es dort.)

PB/PB/EE : PB/EE





Wird die Schnittszene wiedergegeben, und ist Tonsignal-1 und Tonsignal-2 hörbar?

Spult das Band vor, und stoppt es am Bandende? Spult das Band dann automatisch zurück, und stoppt es am Bandanfang?

Wird die Cassette ausgeworfen?



## Überprüfung des Schnittbetriebs

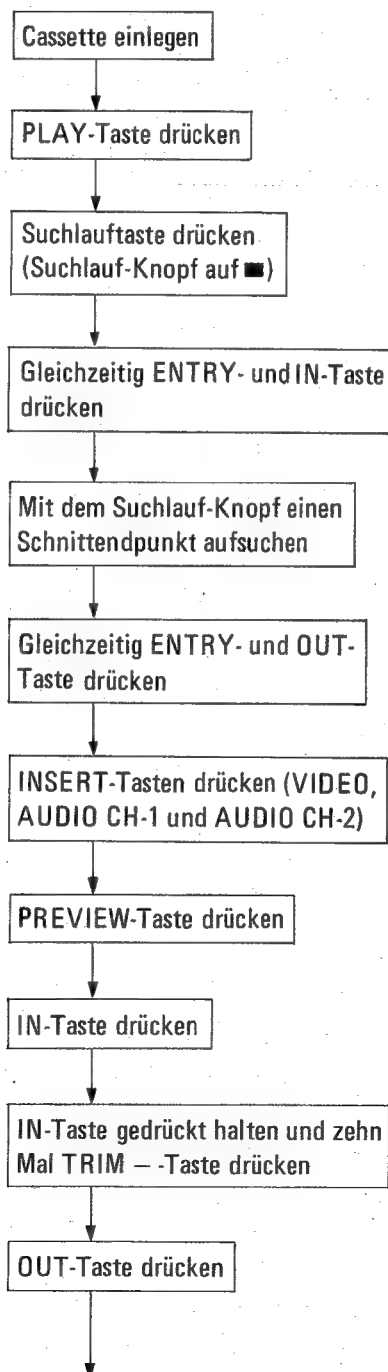
### Vorbereitung

- Bereiten Sie eine Cassette vor, auf der ein Video-, ein Tonspur-1- und ein Tonspur-2-Signal aufgezeichnet ist.
- Schließen Sie Signale an den VIDEO IN- und AUDIO IN-Anschlüssen an.
- Schließen Sie einen Monitor so wie ein Gerät zur Kontrolle des Tonsignals an.

### Stellung der Wähler

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 AUDIO MONITOR : MIX  
 DT SELECT : OFF

### Auszuführende Bedienungsschritte



### Überprüfungspunkte

Erscheint ein Wiedergabebild?

Erscheint ein Standbild?

Notieren Sie den Zählerstand dieses Punktes (Schnittanfangspunkt).

Notieren Sie den Zählerstand dieses Punktes (Schnittendpunkt)

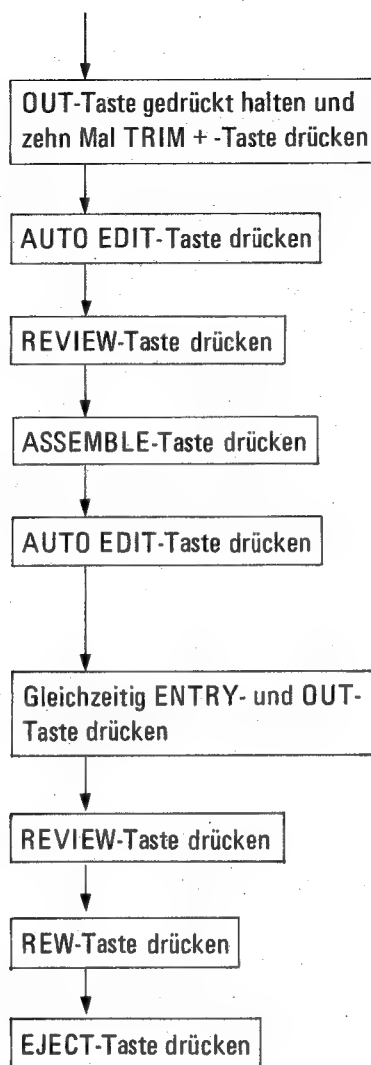
Beginnt der Vorschaubetrieb?

Wird der Schnittanfangspunkt am Zeitzähler angezeigt?

Erniedrigt sich der Zählerstand um zehn Einzelbilder?

Wird der Schnittendpunkt am Zeitzähler angezeigt?





Erhöht sich der Zählerstand um zehn Einzelbilder?

Beginnt der automatische Schnittvorgang?

Beginnt die Kontrollwiedergabe des Schnittvorgangs?

Leuchtet die ASSEMBLE-Lampe?

Wird der Punkt, an dem die ASSEMBLE-Taste gedrückt wird, als Schnittanfangspunkt eingegeben, und beginnt der automatische Schnittvorgang an diesem Punkt?

Wird der Punkt als Schnittpunkt eingegeben, und stoppt der automatische Schnittvorgang an dieser Stelle?

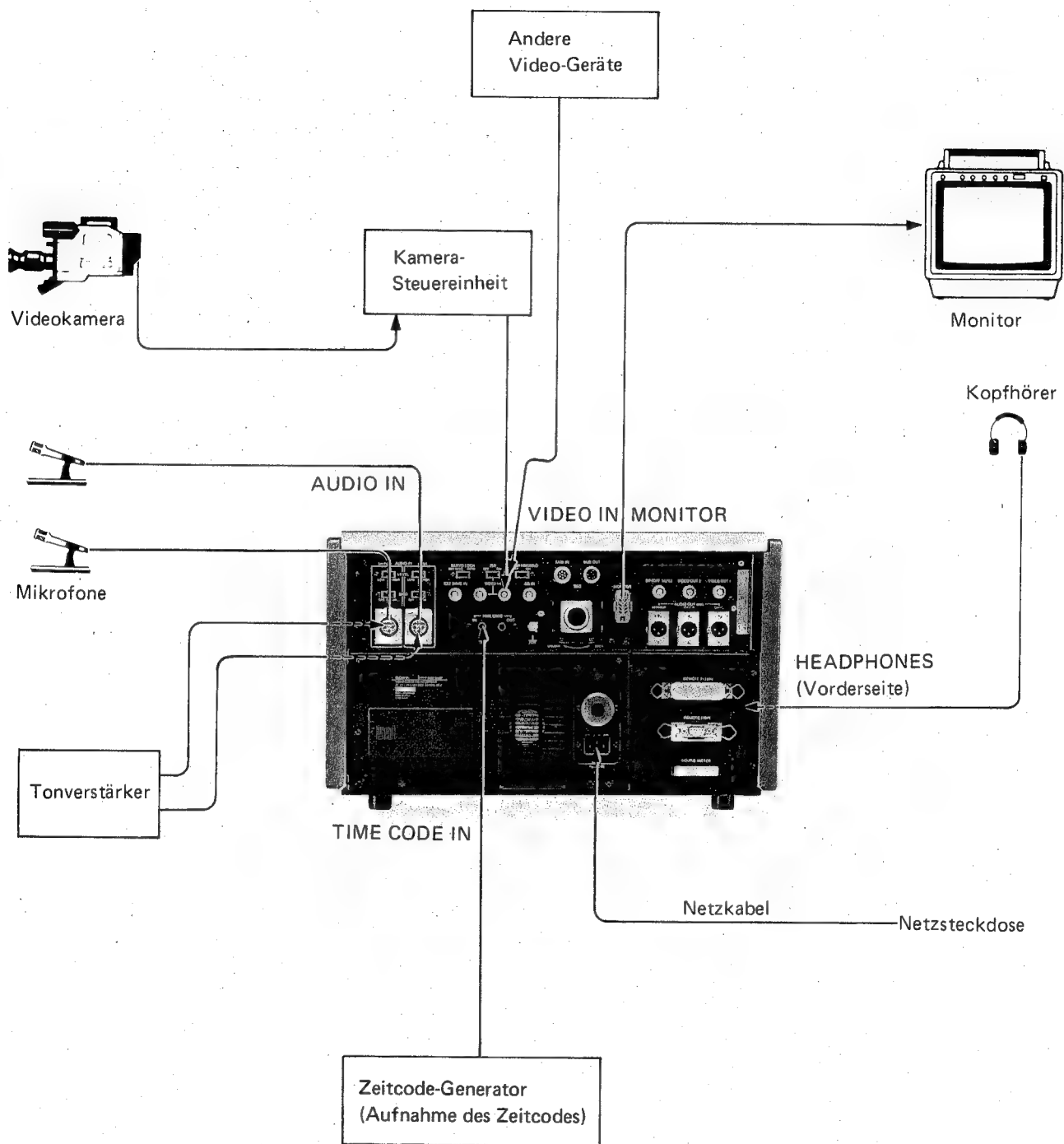
Beginnt die Kontrollwiedergabe des Schnittvorgangs?

Stoppt das Band am Bandanfang?

Wird die Cassette ausgeworfen?



# 1-10. ANSCHLÜSSE AUFNAHME



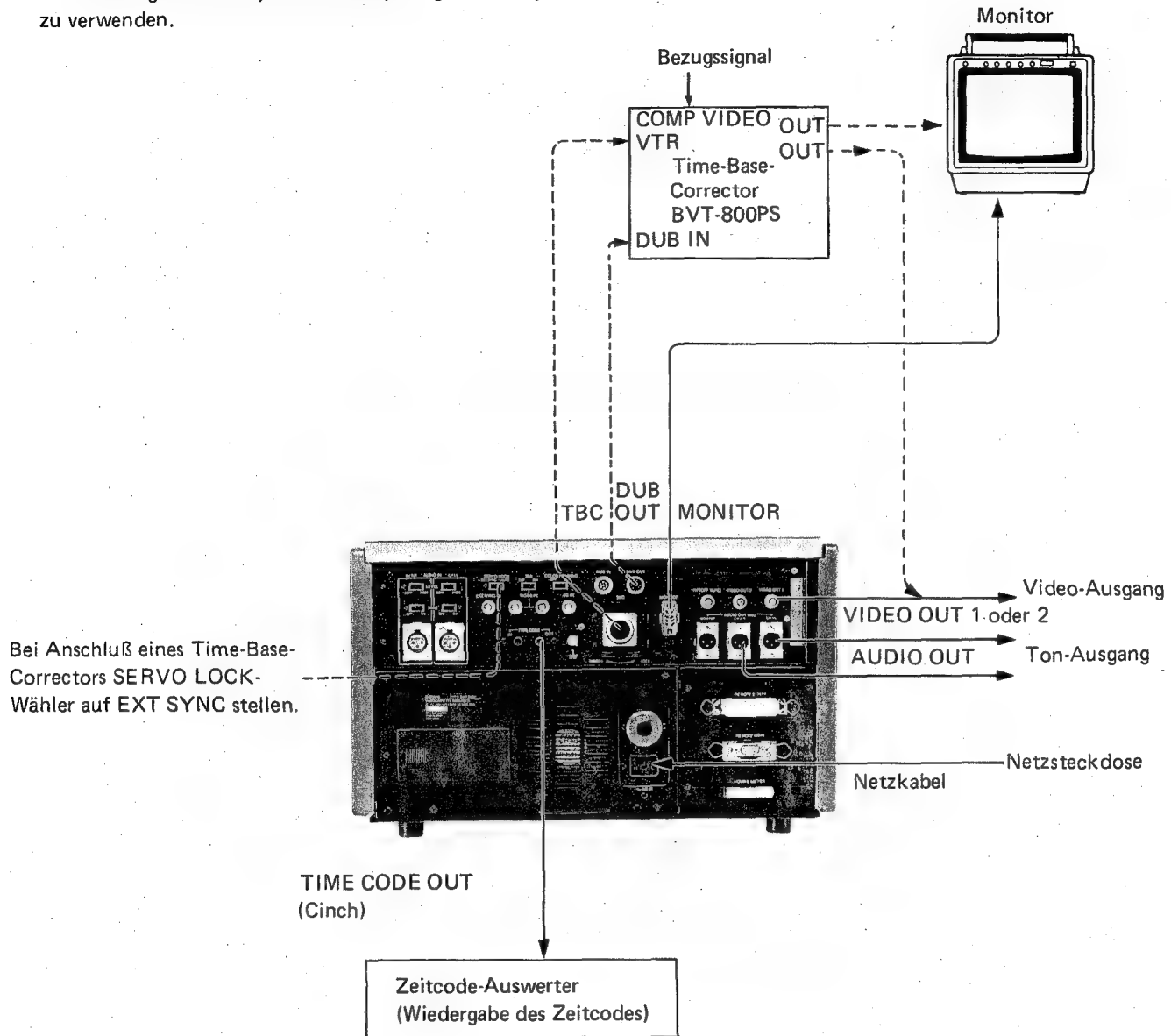


# WIEDERGABE

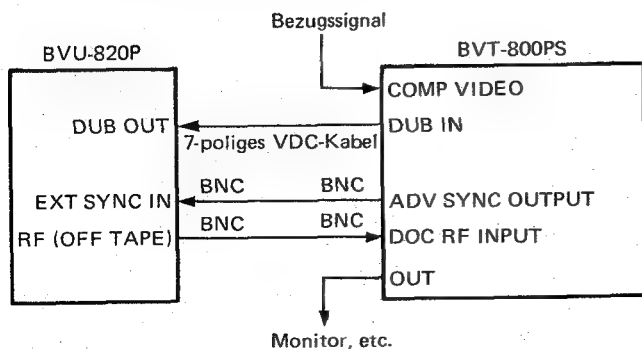
----- bei Anschluß eines Time-Base-Correctors BVT-800PS

----- bei Anschluß für Überspielbetrieb

Zur Wiedergabe mit dynamischer Spurlage ist auf jeden Fall ein Time-Base-Corrector zu verwenden.



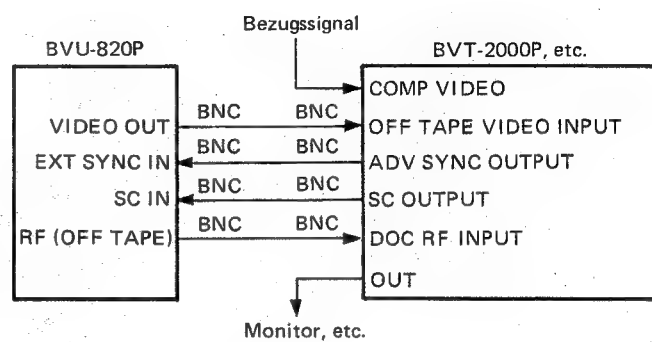
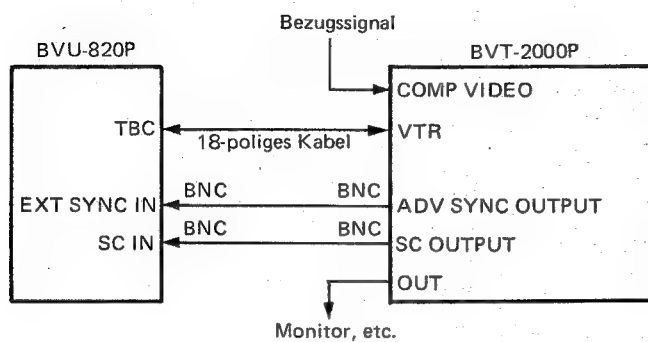
Der BVT-800PS kann ohne Verwendung von einem 18-poligen Kabel wie folgt angeschlossen werden.





Wenn ein Time-Base-Corrector außer BVT-800PS verwendet werden soll, schließen Sie ihn wie folgt an.

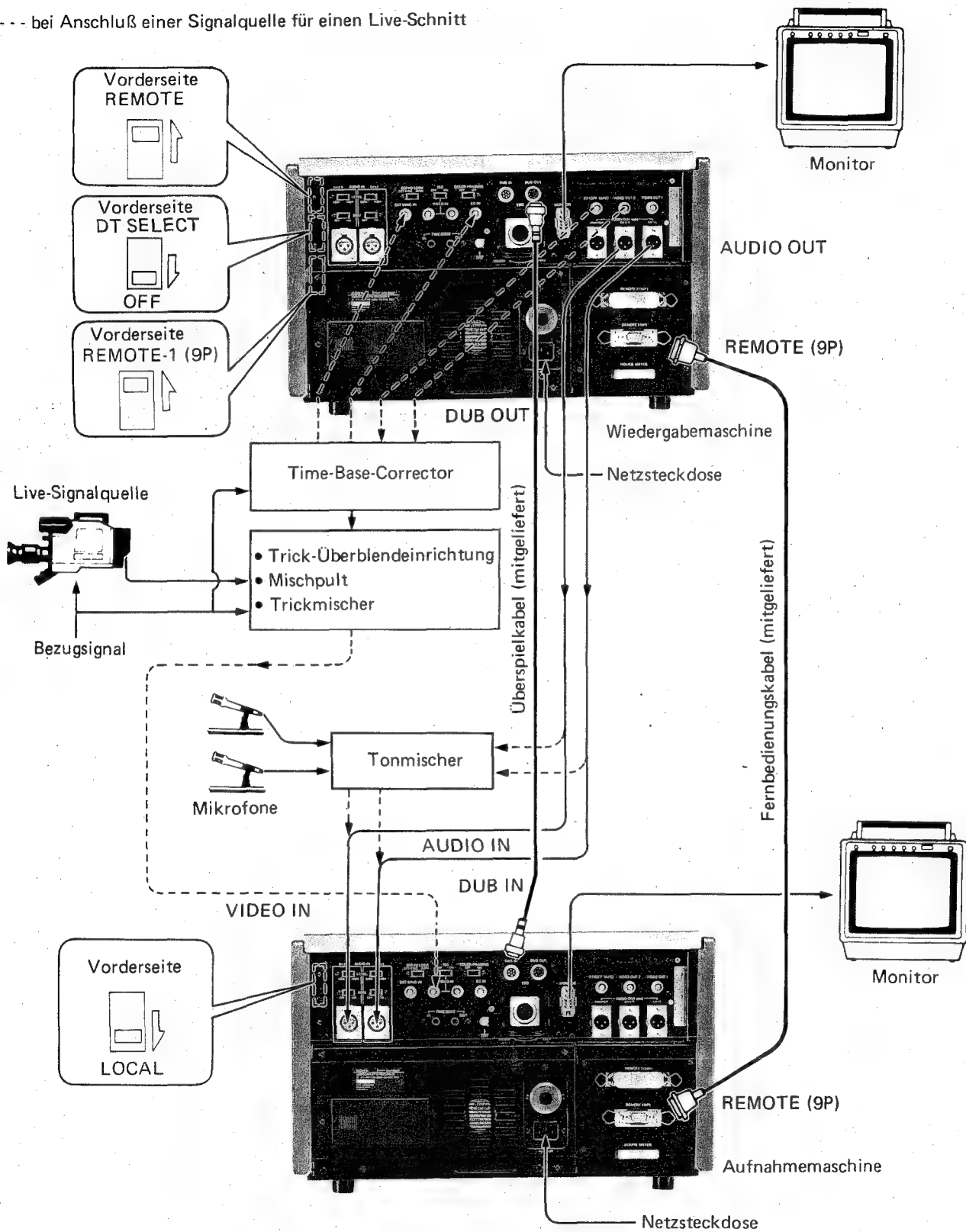
- Zum Anschluß eines BVT-2000P unter Verwendung von einem 18-poligen Kabel.
- Zum Anschluß eines Time-Base-Correctors ohne Verwendung von einem 18-poligen Kabel.





# SCHNEIDEN —unter Verwendung von zwei BVU-820P

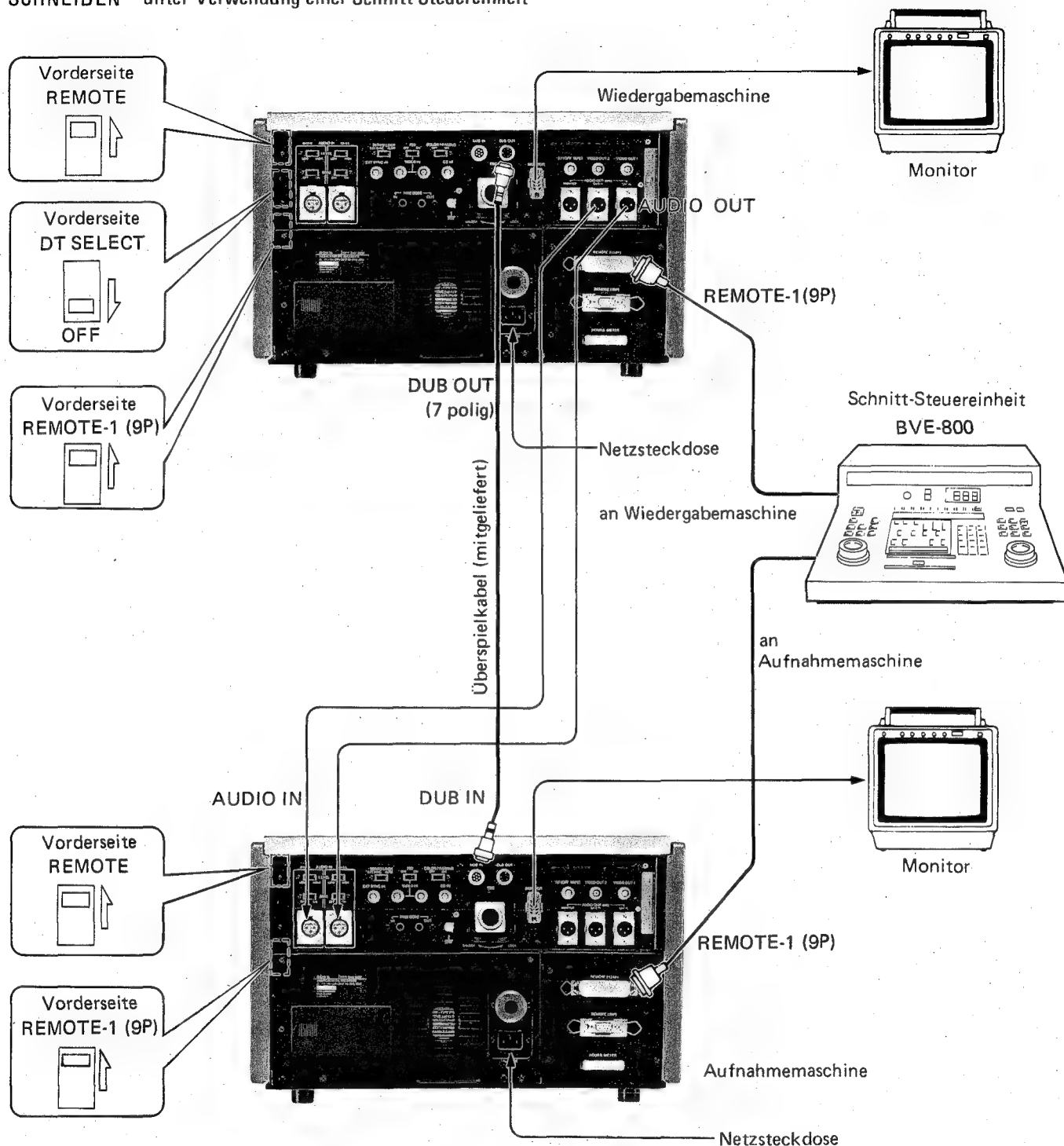
----- bei Anschluß einer Signalquelle für einen Live-Schnitt



- Verbinden Sie nicht noch zusätzlich den DUB IN-Anschluß der Wiedergabemaschine mit dem DUB OUT-Anschluß der Aufnahmemaschine.



## SCHNEIDEN –unter Verwendung einer Schnitt-Steuereinheit



- Verbinden Sie nicht noch zusätzlich den DUB IN-Anschluß der Wiedergabemaschine mit dem DUB OUT-Anschluß der Aufnahmemaschine.
- Zum Anschluß einer Live-Signalquelle siehe vorhergehende Seite.
- Es kann auch ein anderer Video-Cassettenrecorder, der einen 36-poligen bzw. 9-poligen Anschluß besitzt, angeschlossen werden. Es können dann aber nur die am jeweiligen Gerät vorhandenen Bedienungsfunktionen ausgeführt werden.
- Zur Verwendung einer BVE-500ACE, BVE-1000 oder BVE-5000P Schnitt-Steuereinheit lesen Sie die jeweils beim Gerät mitgelieferte Bedienungsanleitung nach.



## 1-11. TECHNISCHE DATEN

## MECHANISCHE BAUTEILE

Gewicht	38kg
Abmessung (B x H x T)	454 x 283 x 550 mm
Betriebslage	Horizontal
Bandlaufwerk	U-matic System (3/4-Zoll KCA, KCS Cassetten)
Bandgeschwindigkeit	9,53 cm/Sek.
Gleichlaufschwankungen	±0,25% (DIN)
Aufnahme/Wiedergabespielzeit	max. 60 Min. mit KCA-60 Video-Cassette
Schnellvorlaufzeit	weniger als 4 Min. mit KCA-60 Video-Cassette
Rücklaufzeit	weniger als 2,5 Min. mit KCA-60 Video-Cassette
Suchlaufgeschwindigkeit	SHUTTLE: DT SELECT-Schalter → SEARCH, OFF Stand, 1/30, 1/10, 1/5, 1/2, 1, 2, 5 und 10 fache Normalgeschwindigkeit in Vorwärts- und Rückwärtsrichtung (Wiedergabe ohne spurrasen Störungen ist möglich.) DT SELECT-Schalter → VAR Normalgeschwindigkeit in Rückwärts- richtung und 3 fache Normalge- schwindigkeit in Vorwärtsrichtung (Wiedergabe ohne spurrasen Störungen) JOG: Stand bis Normalgeschwindigkeit in Vorwärts- und Rückwärtsrichtung (Wiedergabe ohne spurrasen Störungen ist möglich.)

## Anschlüsse

AC IN	3-poliger Wechselspannungsanschluß
VIDEO IN x2	BNC-Anschluß
VIDEO OUT x2	BNC-Anschluß
AUDIO IN CH-1/L, CH-2/R	XLR-Buchse
AUDIO OUT MONITOR	XLR-Stecker
TIME CODE IN	RCA-Cinchbuchse
TIME CODE OUT	RCA-Cinchbuchse
DUB IN	7-poliger Stecker
DUB OUT	7-polige Buchse
SC IN	BNC-Anschluß
EXT SYNC IN	BNC-Anschluß
RF (OFF TAPE)	BNC-Anschluß
TBC	CCY-Anschluß
MONITOR OUT	8-poliger Anschluß
REMOTE (36P)	36-poliger Anschluß
REMOTE (9P)	RS-422 9-poliger Anschluß
HEADPHONES	JM-60 Stereo-Klinkenbuchse

## Betriebstemperatur

+5°C bis +40°C

## Lagertemperatur

-20°C bis +60°C

## ELEKTRISCHE BAUTEILE

Versorgungsspannung	100/120/220/240V ±10%, Wechselspannung (einstellbar) 48 bis 64 Hz
Leistungsaufnahme	170W
Schnittbetriebsarten	ASSEMBLE und INSERT (VIDEO, AUDIO CH-1, AUDIO CH-2), AUTO EDIT, MANUAL EDIT, PREVIEW, REVIEW, PREROLL, TRIM

## VIDEO

## Videoaufzeichnungssystem

Luminanzsignal: Frequenzmodulation  
Chromasignal: Heruntersetzung des  
Farbträgers

## Eingang

PAL-FBAS-Signal, negative  
Synchronisation  
1,0 V<sub>ss</sub>  $\begin{smallmatrix} +1,0 \\ -0,5 \end{smallmatrix}$  V, 75Ω, asymmetrisch

## Ausgang

PAL-FBAS-Signal, negative  
Synchronisation  
1,0 V<sub>ss</sub> ± 0,2V 75Ω, asymmetrisch

## Kopiereingang

Luminanzsignal:  
0,5 V<sub>ss</sub>  
negative Synchronisation,  
Impedanz: 75Ω ± 10%  
Chromasignal:  
0,5 V<sub>ss</sub>  
Impedanz: 75Ω ± 10%

## Kopierausgang

Luminanzsignal:  
0,5 V<sub>ss</sub>  
negative Synchronisation,  
Impedanz: 75Ω ± 10%  
Chromasignal:  
0,5 V<sub>ss</sub>  
Impedanz: 75Ω ± 10%

## Horizontalauflösung

370 Zeilen (bei Schwarzweiß)  
260 Zeilen (bei Farbe)

## Signal-Rauschabstand

besser als 46 dB (bei Schwarzweiß)  
besser als 46 dB (bei Farbe)

## TONTEIL

## Eingang (MIC)

-60 dB, 3 kΩ, symmetrisch  
(für Mikrofone mit 600Ω)

## (LINE)

+4 dB, 10 kΩ/600Ω, symmetrisch

## Ausgang (LINE)

+4 dB, niedrige Impedanz, symmetrisch  
(600Ω Lastimpedanz möglich)

## (HEADPHONES)

-46 bis -26 dB, 8Ω, Stereo

## (MONITOR)

+4 dB, 600Ω, symmetrisch

## Verzerrungen

kleiner als 2,0% (bei 1 kHz-Bezugsignal)

## Frequenzgang

50 Hz bis 15 kHz

## Signal-Rauschabstand

48 dB (bei einem Klirr von 3%)

## TIME CODE-Eingang

0 dB ± 6 dB, 10 kΩ, asymmetrisch  
(0 dB = 1,55 V<sub>ss</sub> Implus)



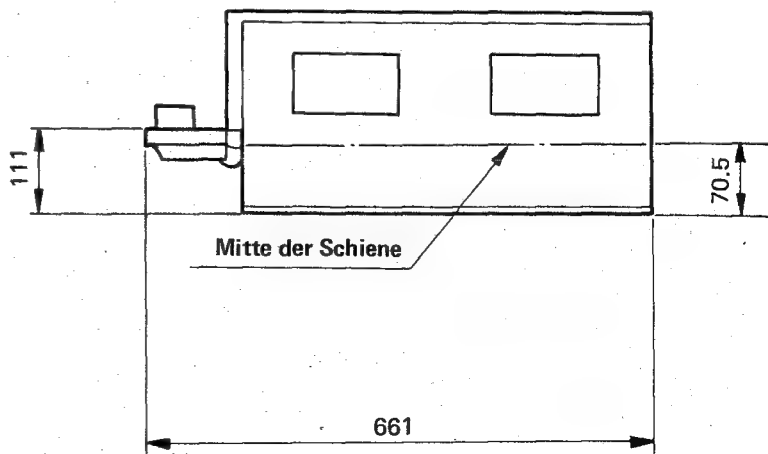
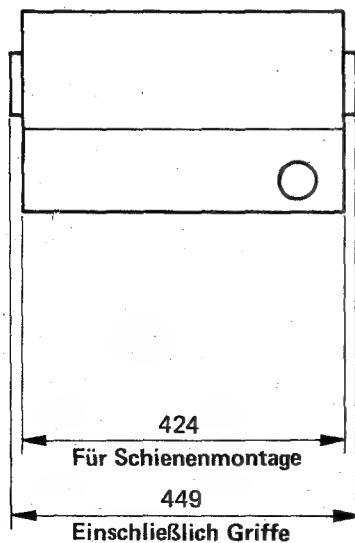
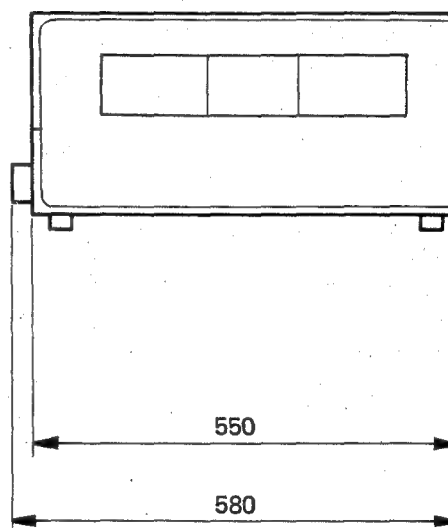
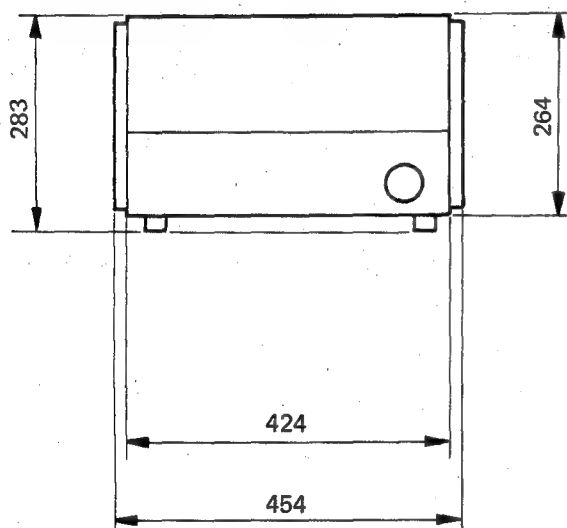
<b>TIME CODE-Ausgang</b>	0 dB $\pm$ 3 dB, niedrige Impedanz, asymmetrisch (0 dB = 1,55 Vss Implus)
<b>SC-Eingang</b>	2 Vss $\pm$ 1V, 75 $\Omega$ , asymmetrisch
<b>SYNC-Eingang</b>	0,2 Vss bis 5 Vss, negativ, 75 $\Omega$ , asymmetrisch (1 Vss $\pm$ 0,2V bei Videoeingangssignal)
<b>RF-Ausgang (OFF TAPE)</b>	0,5 Vss $\pm$ 0,1V, 75 $\Omega$ , asymmetrisch

**Mitgeliefertes Zubehör**

Netzkabel . . . . .	1
Überspielkabel VDC-5 (5m) . . . . .	1
Fernbedienungskabel (9-polig, 9-polig) RCC-5G . . . . .	1
Service-Anschlußplatte EX-7 . . . . .	1
Bedienungs- und Wartungsanleitung . . . . .	1

Änderungen, die dem technischen Fortschritt dienen, bleiben vorbehalten.

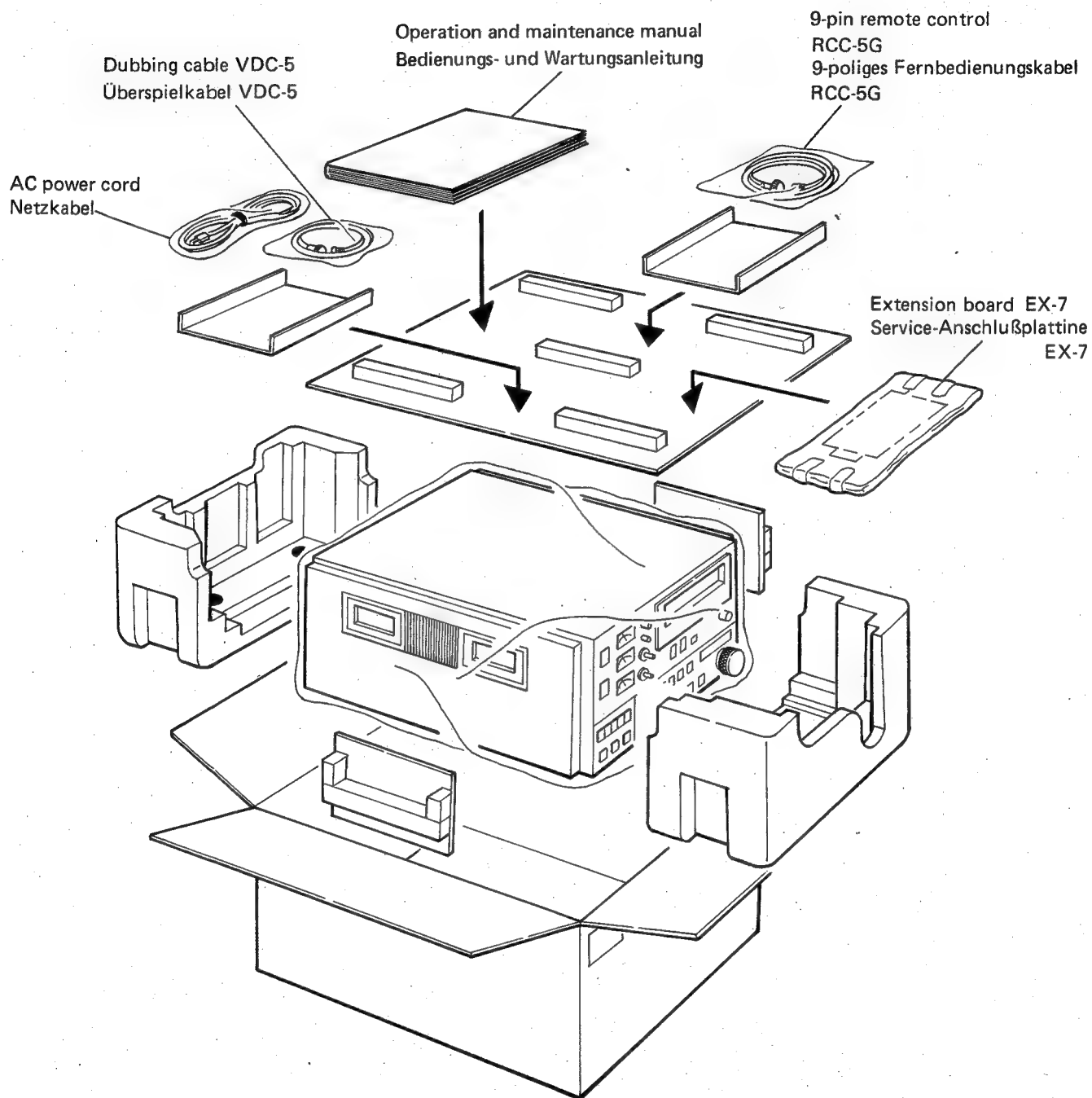
**AUSSENANSICHT DES GERÄTS**



EINHEIT: mm



## 1-12. REPACKING FOR SHIPMENT / WIEDERVERPACKUNG FÜR TRANSPORTZWECKE



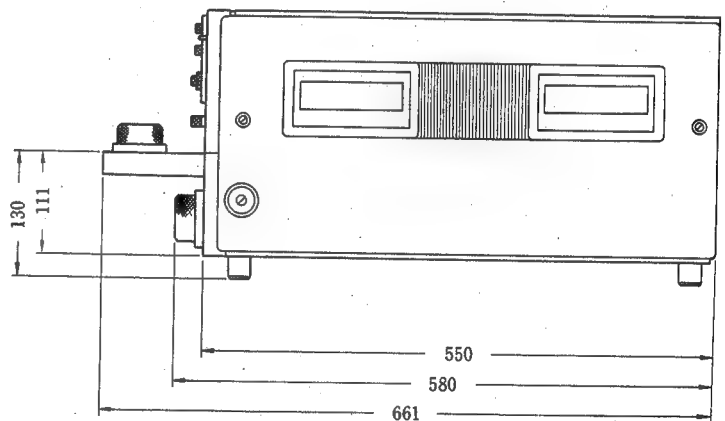
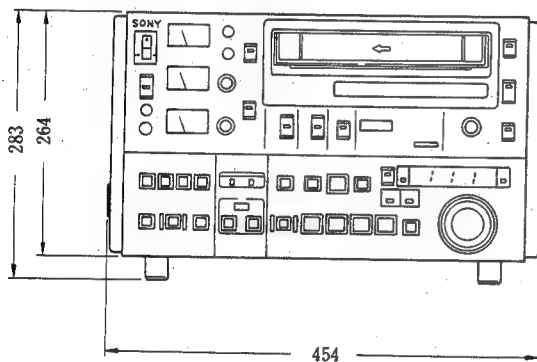


## SECTION 2 INSTALLATION

Be sure to install the BVU-820P at the installation space under the required operational environment as regulated below. It will assure the BVU-820P's superior performance while maintaining the excellent serviceability and accessibility.

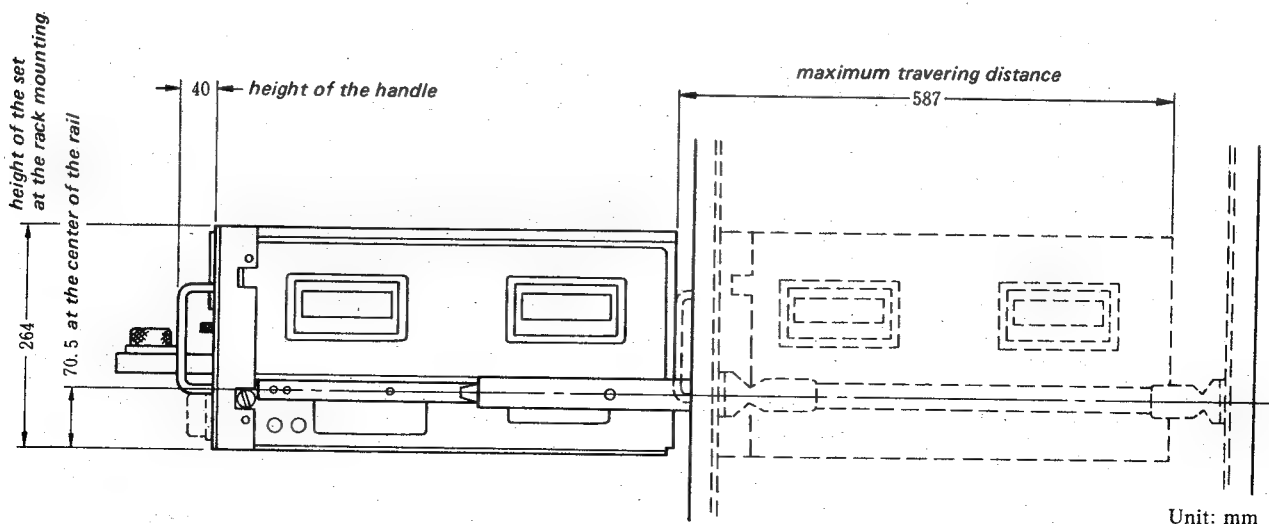
### 2-1. OPERATIONAL ENVIRONMENT

- Areas where the BVU-820P will be exposed to direct sunlight, or any other strong direct lights.
- Avoid installation in dusty areas or areas where it is subject to vibration.
- Avoid areas where high electric or magnetic fields are to be found.
- Good air circulation is essential to prevent internal heat buildup. Place the set in locations with sufficient air-circulation. Do not block the ventilation holes on the cabinet and the rear panel.
- Avoid installation in a location near heat sources. The set should only be operated in a temperature range from 5°C to 40°C.



Unit: mm

When the BVU-820P is mounted in a rack.

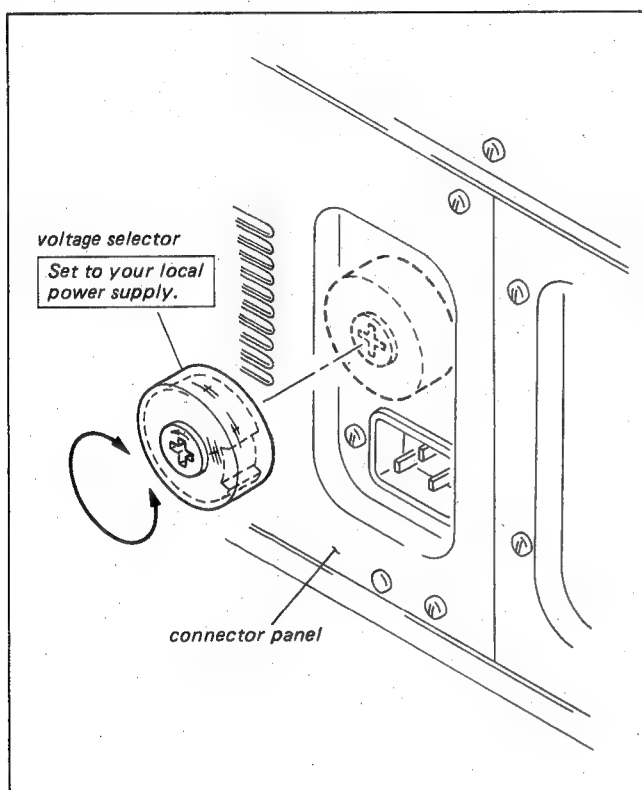


Unit: mm



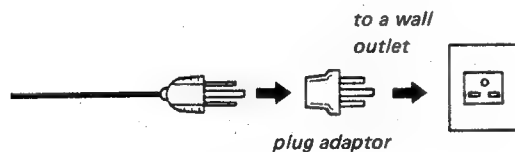
## 2-3. OPERATING VOLTAGE

The BVU-820P's power line voltage can be set to 100 V, 120 V, 220 V or 240V for use anywhere in the world. Before connecting the set to the power source, check that the operating voltage of your set is identical to that of your local power supply. The BVU-820P's can operate on either 50 Hz or 60 Hz.



### Note on AC power connection

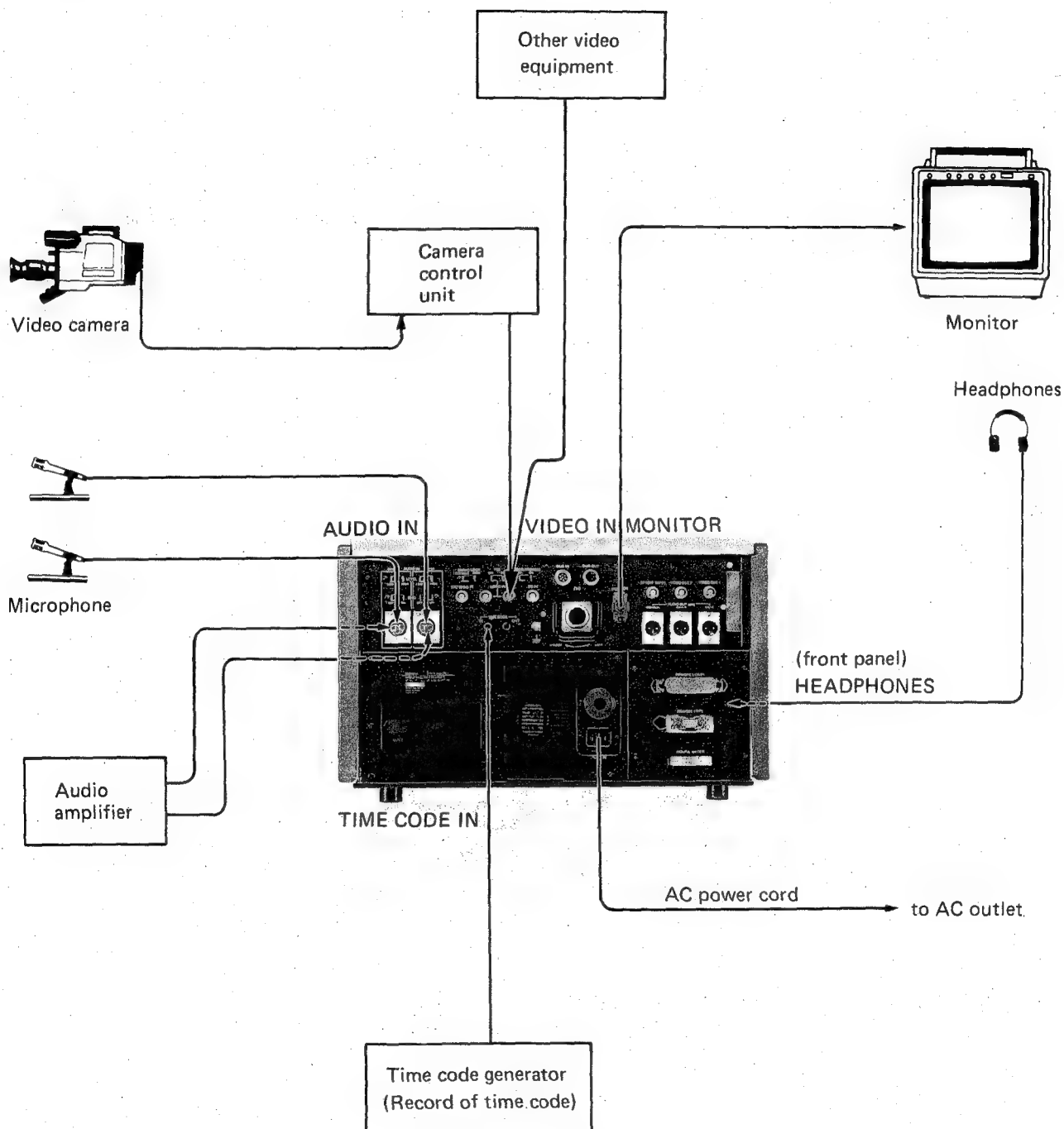
To use the set in other countries on 220 or 240 V ac, set the **VOLTAGE SELECTOR** to 220 or 240 V and use a commercially available plug adaptor as illustrated.





## 2-4. CONNECTIONS

### RECORDING

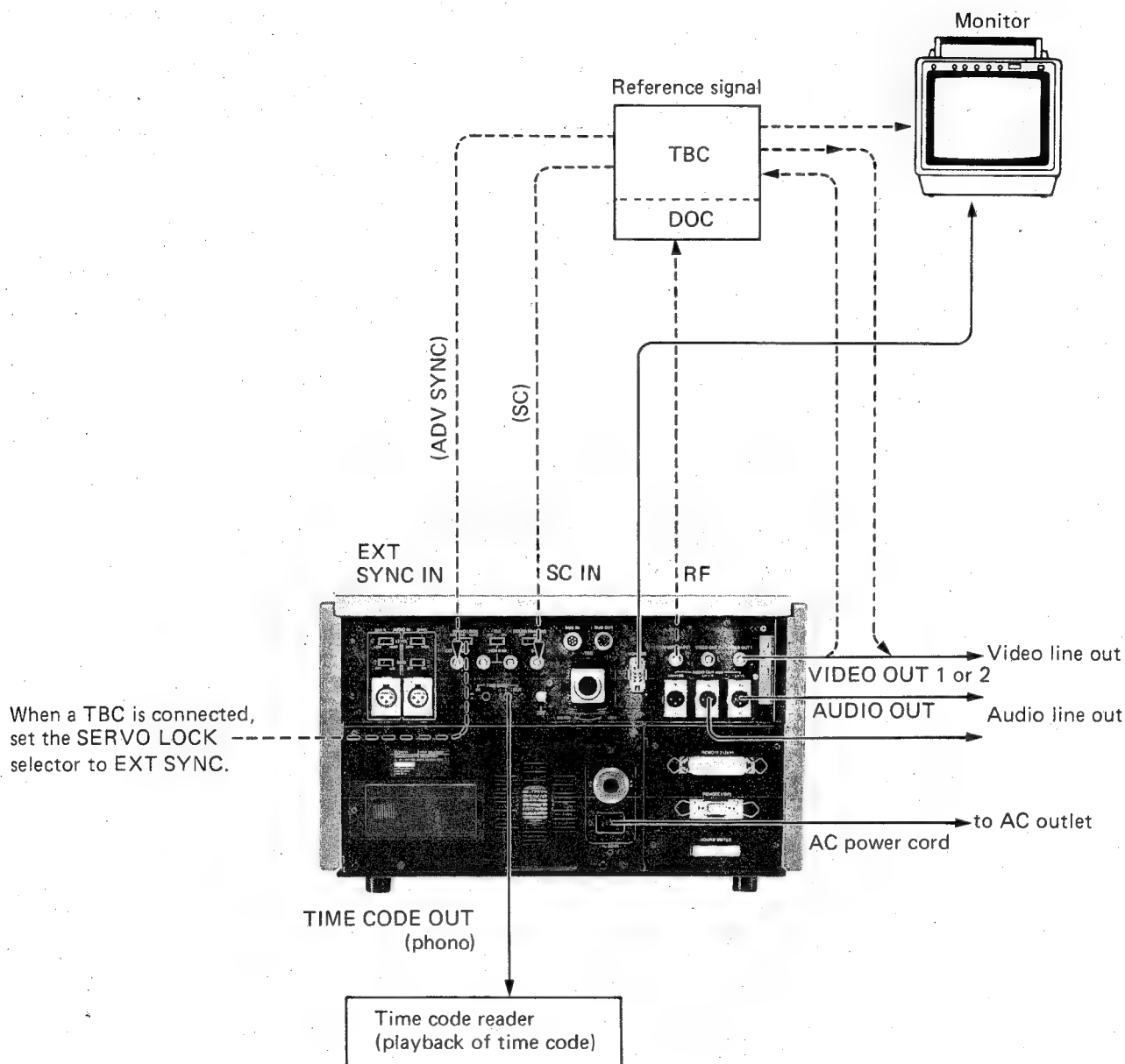




# PLAYBACK

----- for connecting a time base corrector

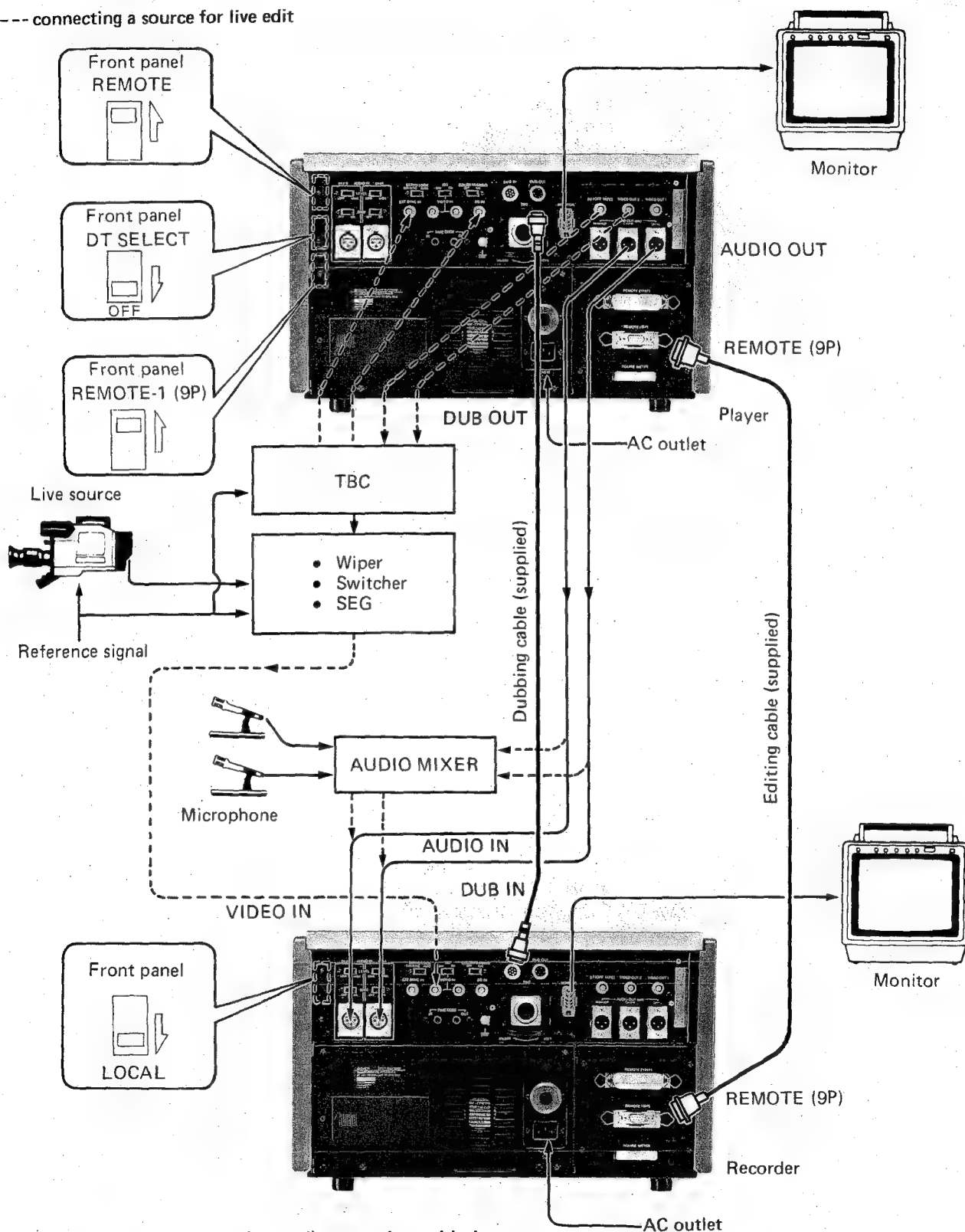
For dynamic tracking playback, be sure to use the time base corrector.





# EDITING — Editing with two BVU-820Ps —

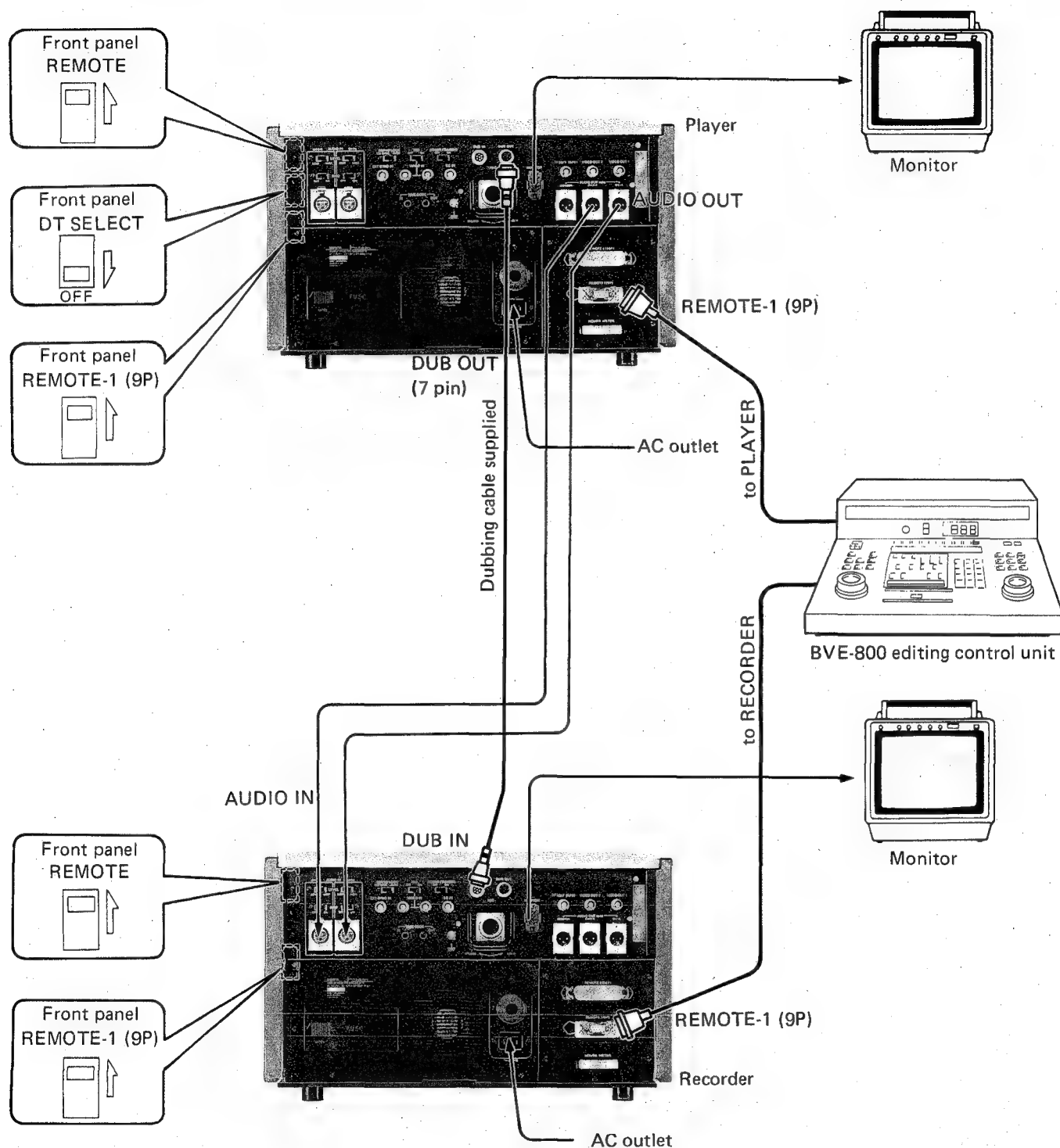
----- connecting a source for live edit



- Do not make simultaneous (parallel) connections with the DUB IN connector on the player and DUB OUT connector on the recorder.



# EDITING — Editing with a control unit —



- Do not make simultaneous (parallel) connections with the DUB IN connector on the player and the DUB OUT connector on the recorder.
- For the live source connection, refer to the previous pages.
- The videocassette recorder with 36 pin or 9 pin connector can be connected other than the BVU-820P, but the function is limited according to the function of the machine.
- To use the BVE-500ACE, BVE-1000 or BVE-5000P editing control unit, refer to the instruction manual furnished with the equipment.



## 2-5. INPUT/OUTPUT SIGNAL OF THE CONNECTOR

Input and output signal of the main connectors on the connector panel are follows:

### INPUT

VIDEO IN	: 1.0 Vp-p $\pm 1.0$ V, sync negative, 75 ohms, unbalanced
EXT: SYNC IN	: 0.2 Vp-p ~ 5 Vp-p, negative, 75 ohms, unbalanced (1 Vp-p $\pm 0.2$ V with VIDEO input)
SC IN	: 2 Vp-p $\pm 1$ V, 75 ohms, unbalanced
AUDIO IN	: MIC: -60 dB, 3 k-ohms, balanced (matches 600 ohm microphone) LINE: +4 dB, 10 k-ohms/600 ohms, balanced
TIME CODE IN	: 0 dB $\pm 6$ dB, 10 k-ohms, unbalanced (0 dB = 1.55 Vp-p pulse)

### OUTPUT

VIDEO OUT	: 1.0 Vp-p, $\pm 0.2$ V, sync negative, 75 ohms, unbalanced
RF OUT (OFF TAPE)	: 0.5 Vp-p $\pm 0.1$ V, 75 ohms, unbalanced
AUDIO OUT	: LINE: +4 dB, low impedance, balanced (600 ohm load permissible) MONITOR: +4 dB, 600 ohm load, balanced HEADPHONES: -46 dB ~ -26 dB, 8 ohms load, binaural
TIME CODE OUT	: 0 dB $\pm 3$ dB, low impedance, unbalanced (0 dB = 1.55 Vp-p pulse)

### REMOTE CONTROL

#### REMOTE 2 (36P)

Pin	I/O Signal	Pulse Width
1	UNREG 5 V	(dc)
2	L-FF COMMAND IN	more than 5 msec.
3	L-FWD COMMAND IN	more than 5 msec.
4	L-REW COMMAND IN	more than 5 msec.
5	L-EJECT COMMAND IN	more than 5 msec.
6	L-STOP COMMAND IN	more than 5 msec.
7	L-PAUSE COMMAND IN	more than 5 msec.
8	L-REC COMMAND IN	more than 5 msec.
9	L-CUT IN COMMAND IN	more than 5 msec.
10	L-EDIT COMMAND IN	more than 5 msec.
11	L-CUT OUT COMMAND IN	more than 5 msec.
12	L-FF STATUS OUT	
13	L-FWD STATUS OUT	
14	L-REW STATUS OUT	
15	L-STANDBY STATUS OUT	
16	L-STOP STATUS OUT	
17	L-PAUSE STATUS 1 OUT	(dc)

18	L-REC STATUS OUT	
19	L-INSERT STATUS OUT	
20	L-VIDEO INSERT IN	
21	L-AUDIO 1 INSERT IN	
22	L-AUDIO 2 INSERT IN	
23	L-REVERSE COMMAND IN	(dc)
24	SPEED A IN	
25	SPEED B IN	
26	L-CTL PULSE OUT	
27	L-TACH OUT	
28	L-CAPSTAN OUT	
29	SYNCHRONIZE IN	
30	NC	
31	H-NORMAL FWD IN	
32	L-PAUSE STATUS 2 OUT	
33	L-SEARCH COMMAND IN	"L" level during shuttle or jog mode
34	NC	
35	GND	
36	GND	

### TBC

Pin	I/O Signal
A	EXT SYNC IN (X)
B	GND
1	VIDEO OUT (X)
2	VIDEO OUT (G)
3	DT-V (X)
4	DT-V (G)
5	OFF TAPE
6	DOC PULSE (X)
7	DOC PULSE (G)
8	PLAY STATUS
9	DUB C OUT (X)
10	FH (X)
11	FH (G)
12	L-CONFI (TBC)
13	DUB Y OUT (X)
14	DUB Y OUT (G)
15	L-DT ON (TBC)
16	NC



## 2-6. CONNECTION CONNECTOR

When external cables are connected to the various connectors on the BVU-820P connector panel during the installation or the maintenance, hardwares as stated below or the equivalents must be used.

Panel Indication	Connection Connector
VIDEO IN EXT. SYNC IN SC IN VIDEO OUT 1 VIDEO OUT 2 RF (OFF TAPE)	1-560-069-11 PLUG, BNC, MALE
DUB IN	1-561-055-00 PLUG, 7P, FEMALE
DUB OUT	1-508-948-00 PLUG, 7P, MALE
AUDIO IN	1-508-084-00 CONNECTOR, 3P, MALE
AUDIO OUT	1-508-083-00 CONNECTOR, 3P, FEMALE
TIME CODE	1-506-311-00 PLUG, PIN
MONITOR	1-506-161-00 CONNECTOR, 8P, MALE
TBC	1-508-495-00 PLUG, 9P, MALE
REMOTE 2 (36P)	1-508-852-00 CONNECTOR, 36P, MALE
REMOTE 1 (9P)	1-560-651-00 PLUG, 9P (M) AND 1-561-749-00 JUNCTION SHELL, 9P

## 2-7. SELECT SWITCH SETTING

Along with the select switches on the control panel and the connector panel, the switches listed below are on the circuit boards. The functions of these switches on the circuit boards are described and the switches must be used according to systems and conditions.

### • SY-37 board

- (i) **SYNCHRONIZE sw. (Ref. No., S2-1)**  
In PREVIEW or AUTO EDIT mode, recorder will perform synchronization to the player by SEARCH mode between PREROLL-point and IN-point (VTR synchronization). This switch select either to use this function or not. Because synchronization will be performed by recorder, this switch of the player does not be effected.  
ON: Perform synchronization.  
(PREROLL TIME will be adjusted to 10 seconds automatically and PREROLL TIME switch will be nullified.)  
OFF: No synchronization.  
When the set is shipped, the SYNCHRONIZE sw is set to the OFF position.
- (ii) **PREROLL TIME sw. (Ref. No., S2-3)**  
Selects 5 seconds or 10 seconds for the preroll time at the editing.  
ON: 5 seconds  
OFF: 10 seconds

When the set is shipped, the PREROLL TIME switch is set to the OFF position.

- (iii) **SEARCH DIAL sw. (Ref. No., S2-2)**  
There are two ways to set up the SHUTTLE mode from the PLAY mode.  
(1) SEARCH dial is turned directly without pressing the SHUTTLE button in the PLAY mode.  
(2) The SHUTTLE button is pressed in the PLAY mode.  
The SEARCH DIAL switch selects above two system (1) or (2).  
ON: system (1)  
OFF: system (2)  
When the set is shipped, the SEARCH DIAL switch is set to the ON position. When the BVU-820P is used as the playback machine (such as on air), it is recommended to use the second method (the switch is in the OFF position) to avoid accidental mode switching.
- (iv) **EIA/CCIR select sw. (Ref. No., S5)**  
Selects for EIA use or CCIR use for the TIMER DISPLAY.  
For EIA use: Switch 1 is only OFF position, the other switches are ON position.  
For CCIR use: All the switches are ON position.  
When the set is shipped, the EIA/CCIR select switch is set to the CCIR position.
- (v) **KEY select sw. (Ref. No., S3)**  
The function of BVU-820P can be controlled by either control panel of unit or optional control panel (BK801). However, to connect both control panel two of 40 pin flat cable connectors were equipped on SY-37 board.  
This switch select one function control panel from above two.  
This switch positioned to front: CN31 is selected.  
This switch positioned to back: CN32 is selected.  
When the set is shipped, the KEY switch is set to the CN31 is selected position.
- (vi) **CTL Indicator (Time counter) function select sw. during time code mode. (Ref. No., S5-3)**  
Selects CTL data display or Time Code data display in Time Code mode.  
(1) When BVU-820P is used in Time Code mode or Auto mode with TC-20 board or optional Time Code Generator/Reader (BK806), the CTL data is indicated on the indicator by pressing the **LAP** button on the function of BVU-820P twice in 0.6 seconds. Still the Time Code data controls the VTR.  
(2) In the above mode (CTL data display mode) when the **LAP** button is pressed twice again in 0.6 seconds, the indicator will be changed to indicate the Time Code data. CTL data display can be changed to time code display by selecting from player Local mode to Remote mode and by pressing RECORDER select button on the front panel of the BVU-820P.  
(3) When editing a recorded tape that has no Time Code signal recording, the Time Code data is reset by pressing the **RESET** button.  
(4) When the tape is ejected, the Time Code data and the CTL data are not reset automatically. Press the **RESET** button and these data will be reset.  
(5) In the case of Data communication between two sets (9 pin, RS422), the indicator of Player BVU-820P machine remains same as indication, before ROMs update.  
For CTL Indicator in Time Code mode, set this switch to OFF.  
Except above mode, set this switch to ON.  
When the set is shipped, this switch is set to the ON position.



(vii) AUDIO/VIDEO Edit Timing Difference Compensation sw. (Ref. No., S5-4)

This switch can compensate for the timing difference of editing points of Audio and Video in Auto editing mode or Assembly editing mode. Also this switch is controlled by ROMs of version 8.

In order to compensate for the timing difference of editing point, perform the following procedure.

- (1) Select the "Edit command timing switch" which is installed on optional unit such as BVE-800 and BVE-3000 etc.

Select to "-3" frames.

(2) Conditions

1. When the editor is used to editing, use the editor that is equipped with "Edit command timing switch", such as BVE-800, BVE-1000, BVE-3000A and BVE-5000.
2. Controlled by 9 pin (RS422).
3. Audio cut-in point will have double recording in 2 frame period.

To compensate for the timing difference of Audio and Video, set this switch to OFF.

If not compensating, set this switch to ON.

When the set is shipped, this switch is set to the ON position.

(viii) DTR-2000 Select sw. (Ref. No., S5-5)

When connecting with DTR-2000 and assembly editing is done, set this switch to OFF.

(The previous recorded time codes are read and the relative next time codes is recorded at the editing point so that the consecutive time codes are recorded on the tape.)

When remote control (BVE-800 or etc.) other than DTR-2000 is connected, set this switch to ON.

When the set is shipped, this switch is set to the ON position.

• MD-18 board

(i) HIGH FREQUENCY ON/OFF sw. (Ref. No., S1)

This switch is only used for electrical alignment. When the set is shipped, the HIGH FREQUENCY ON/OFF switch is set to the OFF position.

• YD-14 board

(i) SWITCHING TRANSIENT MUTING ON/OFF sw. (Ref. No., S1)

This switching transient is compensated with 1H delayed signal in BVU-820P in order to prevent the switching transient. This switch determines to this circuit or not.

ON: Compensates the switching transient with 1H delayed signal.

OFF: Does not compensate.

When the set is shipped, the SWITCHING TRANSIENT MUTING switch is set to the ON position.

(ii) VIDEO DOC MUTING sw. (Ref. No., S2)

When a "character signal" is inserted into video signal with such an excessive amplitude that sync signal is affected, the video DOC circuit may erroneously function. Practically, the BVU-820P's video DOC circuit detects the character signal as a drop-out signal so that the character signal portion is replaced by the 1H delay signal. As a result, the super-imposed character will be erased. In order to prevent this phenomenon, BVU-820P is equipped with the muting switch for video DOC circuit.

ON: Mutes the video DOC circuit.

OFF: Does not mute.

When the set is shipped, the VIDEO DOC MUTING switch is set to the OFF position.

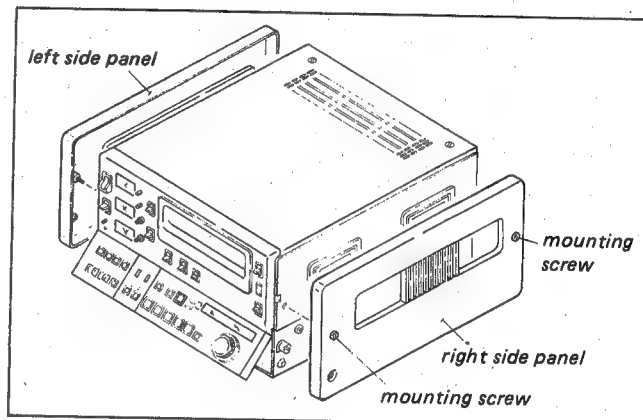
## 2-8. RACK MOUNTING

The BVU-820P can be mounted in 19-inch standard rack. It is recommended to use the PACK MOUNT KIT, BK805, optional part (including the slide rails and the handle brackets) or the following ACCURIDE'S slide rail.

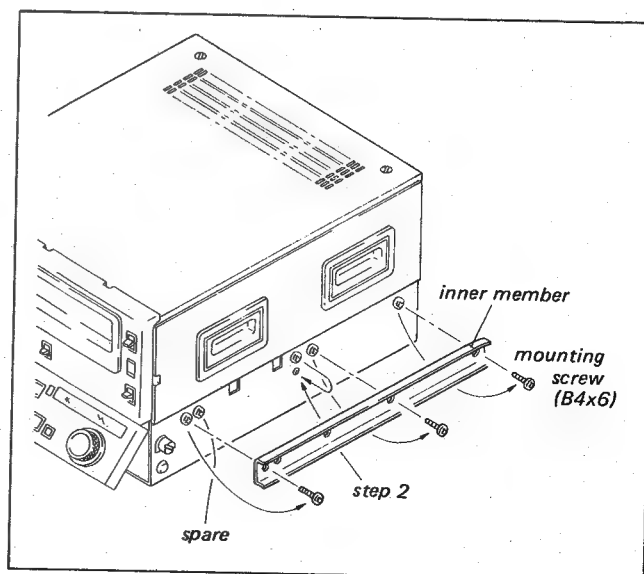
RACK-MOUNT SLIDES MODEL 305

SLIDE LENGTH 22 INCH

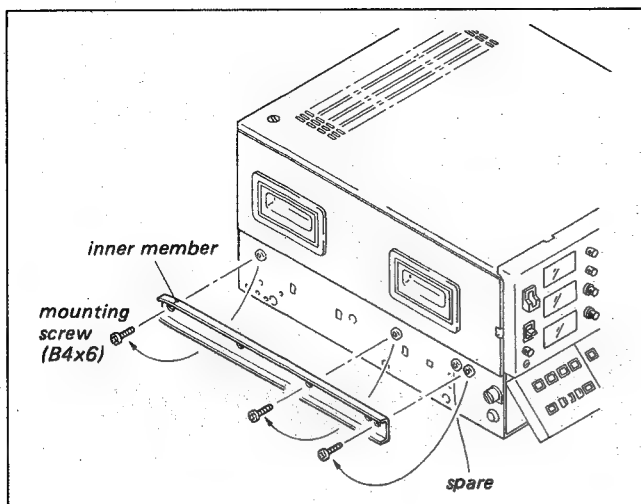
1. Loosen two mounting screws on the right and the left side panels.
  - Mounting screws will not be detached since it uses a retainer on the inside the cover.



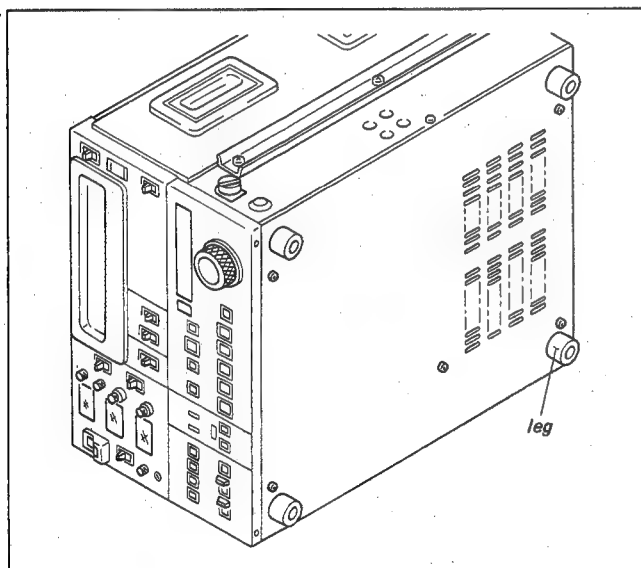
2. Remove a mounting screw on the chassis (R) as shown in figure, and thread the mounting screw to a lower hole.
3. Remove the each four mounting screws on the (R) chassis and the (L) chassis.
4. Attach the inner members of the slide rails to the (R) chassis and the (L) chassis with the screws removed in step (3).
  - Length of the screws used for the attachment is limited. If the screws supplied with the chassis are lost, a screw 6 mm in length (B4x6) must be used.
  - The inner member must be fixed at three points with the screws.



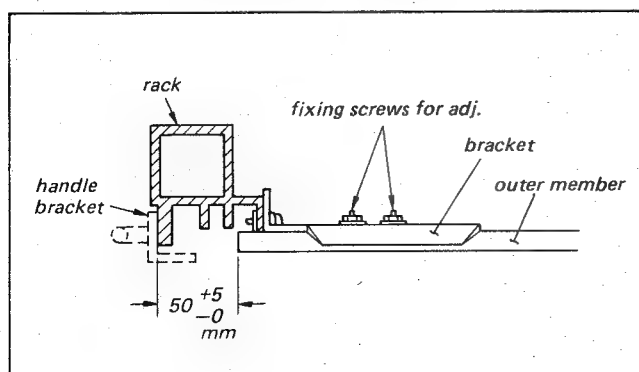




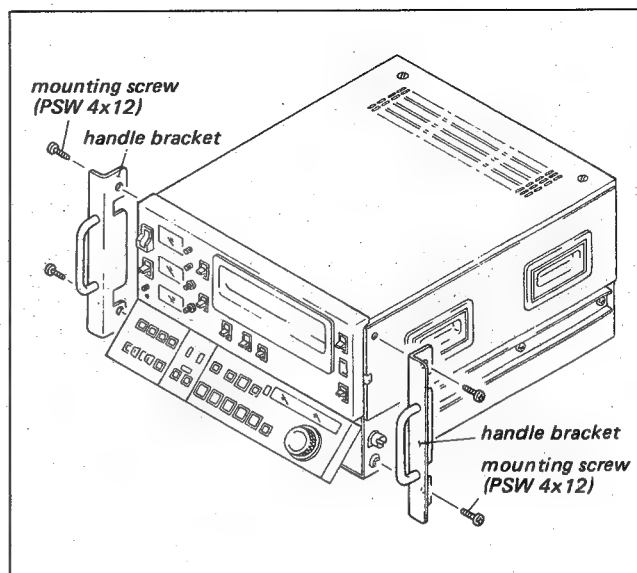
5. Remove four legs located under the set.
- If the set is mounted in the rack without removing the legs. It will contact the lower set and the upper set cannot be pulled out from the rack.



6. Attach the outer member bracket of the slide rail to the rack and position from the edge of the slide rail to the outside of the rack so that the position satisfies to the specified value.

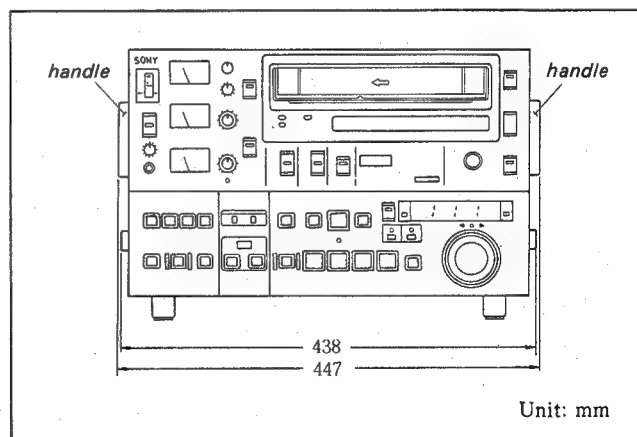


7. Attach the handle brackets.



**NOTE:**

1. Six sets of the BVU-820P can be mounted on the 19-inch standard rack.  
When the several sets are mounted on the rack, it is recommended to install the fan for ventilation. Good air circulation is essential to prevent internal heat buildup in the rack. 5°C to 40°C environmental condition must be met throughout all units.
2. Be sure to stabilize the rack to the floor to avoid the accidents when the BVU-820P is pulled out.
3. Dimension without side panels are shown in figure.  
If the rack front width is narrower than the set width, the set must be mounted after the handles on the right and left made been removed.

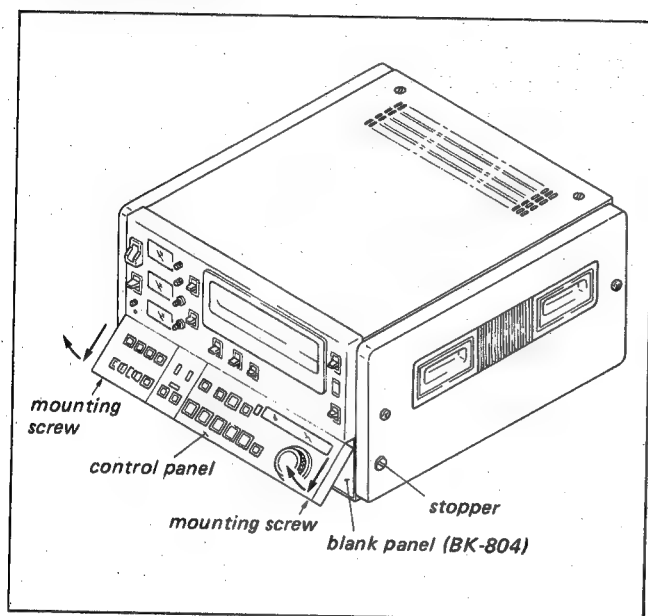




## 2-9. CONTROL PANEL UNIT REMOVAL

When the control panel unit is removed to be used as the remote control unit, perform the following steps.

1. Loosen the control panel stopper on the right and the left side panels. Open the control panel.



2. Remove two mounting screws as shown in figure and move the control panel unit in the direction shown by the arrows for removal.
3. Remove the flat cable on the rear side of the control panel.
4. Connect the optional flat cable (5 m), BK802. (Refer to sec. 2-11.)
5. Attach the optional blank panel, BK804.

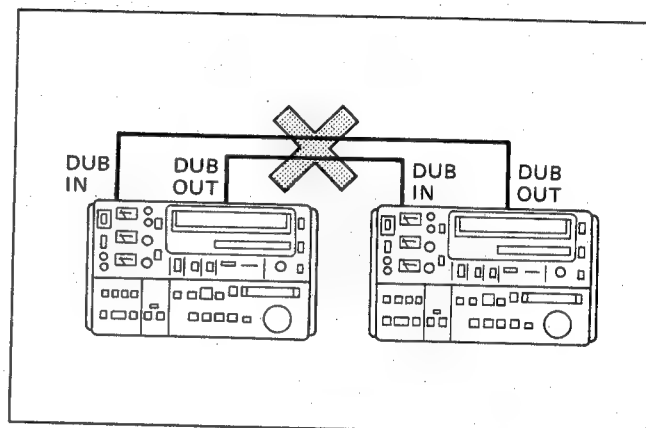
## 2-10. SUPPLIED ACCESSORY

Supplied BVU-820P accessories are as follows.

1. AC Power Cord

2. Dubbing Cable (VDC-5)

This cable is utilized when the tape to tape editing and dubbing are used with using the dubbing cable. (length: 5 m)  
Only the video signal can be transmitted by this cable and the audio signal does not. For the audio signals the different cables are required.



3. 9 Pin Remote Control Cable

This cable is used for the remote control from one BVU-820P as a recorder to the other BVU-820P as a player when the two sets of the BVU-820P are used for the tape to tape editing and dubbing.

4. Extension Board (EX-7)

The BVU-820P main circuit board is a plug-in type which is easy to remove or install. Extension board, EX-7 is used for check and maintenance of the main board.

It is more than adequate with supplied extension board. However, if it is required to have additional boards, it can be obtained through service organization.

## 2-11. OPTIONAL ACCESSORY

The followings are provided as the optional accessory. The suitable accessory should be used for each system.

1. Control Panel (BK801)

When the BVU-820P is operated from the remote place, the function control panel of the BVU-820P can be separated and functioned as the remote controller. And also the other remote controller (BK801) is provided as the optional accessory. The BK801 includes the control panel and 40P flat cable which connects the control panel to the BVU-820P.

2. 40P Flat Cable (BK802)

40P flat cable is used for connecting the control panel to the BVU-820P, when the control panel unit is separated from the BVU-820P and used as the remote controller.

This cable length is 5 m, however in case that the different cable is required, the following cable are recommended.



Produced by 3M

3517 Series

#28 AWG Stranded

Jacketed/Shielded Flat Cable

.050" (1.27 mm) Center Spacing

Number of Conductors: 40

The flat cable can be extended up to maximum 10 m (in no interference condition such as an electrical noise).

Installation:

1. Open the function control panel.
2. Remove the bottom plate and FC retainer (rear).
3. Install the 40P flat cable as shown in figure.

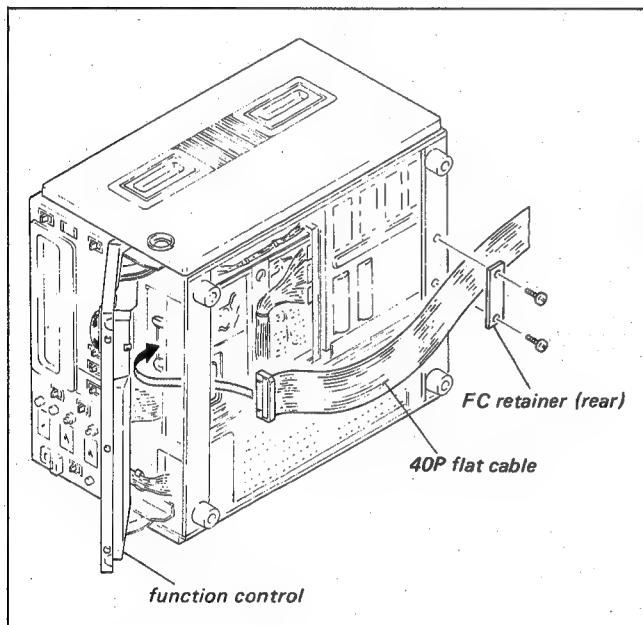
8. 9-Pin Remote Control Cable (RCC-5G, RCC-10G, RCC-30G)

Three kinds of 9-pin remote control cable are provided.

Type	Length
RCC-5G:	5 m
RCC-10G:	10 m
RCC-30G:	30 m

This remote cable connects the 9-pin remote connector on the connector panel to the BVU-820P.

**NOTE:** The remote cable can be extended up to 1200m.



3. Control Panel Case (BK803)

The BK803 control panel case is the optional unit which houses the remote control panel dismantled from the BVU-820P.

4. Blank Panel (BK804)

The BK804 blank panel is the plate which covers the block of BVU-820P resulted in empty by removing the control panel.

5. Rack Mount Kit (BK805)

The BK805 rack mount kit is used for mounting the BVU-820P on the 19-inch standard rack. This mounting kit consists of two slide-rails and two handle-brackets.

6. Time Code Generator/Reader (BK806)

The BK806 is a time code generator/reader to make time code editing for a BVU-820P.

7. Function Panel Rear Cover (BK811)

The BK811 function panel rear cover is the plate which covers the rear side of the function control when the control panel is tilted.



## SECTION 3

### TECHNICAL INFORMATION

#### 3-1. SPECIFICATIONS

##### GENERAL:

###### MECHANICAL:

Weight: 38 kg (83 lb 12 oz)  
Dimensions: 454 x 283 x 550 mm (17 7/8 x 11 1/4 x 21 3/4 inches) (w/h/d)  
Tape transport mechanism: U-matic system (3/4 inch cassettes)  
Tape speed: 9.53 cm/s  
Wow/flutter: less than 0.2% rms  
Record/playback time: Maximum of 60 min. with type KCA-60 video cassette  
Fast forward time: Less than 4 min. with type KCA-60 video cassette  
Rewind time: Less than 2.5 min. with type KCA-60 video cassette  
Search speed: SHUTTLE:  
DT SELECT switch:  
SEARCH or OFF position  
Still, 1/30, 1/10, 1/5, 1/2, 1, 2, 5, and 10 times normal in forward and reverse direction  
DT SELECT switch:VAR position  
1 time in reverse direction to 3 times in forward direction.  
JOG:  
Still to 1 (8 steps) in forward and reverse direction

###### CONNECTORS:

AC IN: 3-pin AC connector  
VIDEO IN x2: BNC connectors  
VIDEO OUT x2: BNC connectors  
AUDIO IN CH-1/CH-2: XLR female connectors  
AUDIO OUT CH-1/CH-2: XLR male connectors  
AUDIO OUT MONITOR: XLR male connectors  
TIME CODE IN: RCA phono jack  
TIME CODE OUT: RCA phono jack  
DUB IN: 7-pin male connector  
DUB OUT: 7-pin female connector  
SC IN: BNC connector  
EXT SYNC IN: BNC connector  
RF OUT (OFF TAPE): BNC connector  
TBC: CCY connector  
MONITOR OUT: 8-pin connector  
REMOTE (36-p): 36-pin connector  
REMOTE (9-p): RS-422 9-pin connector  
HEADPHONES: JM-60 headphones binaural jack  
Operating temperature: +5°C to +40°C  
Storage temperature: -20°C to +60°C

###### ELECTRICAL:

Power requirements: AC 100/120/220/240V  $\pm$  10% (Selectable) 48 to 64 Hz  
Power consumption: 170W  
Editing functions: ASSEMBLE and INSERT (VIDEO, AUDIO CH-1, AUDIO CH-2)  
AUTO EDIT, MANUAL EDIT  
PREVIEW, REVIEW, PREROLL, TRIM

##### VIDEO:

Video recording system: Luminance: FM  
Chroma: SC low-range conversion  
Input: PAL composite video, sync negative 1.0 Vp-p  $\pm$  0.5 V 75 $\Omega$ , unbalanced  
Output: PAL composite video, sync negative 1.0 Vp-p  $\pm$  0.2 V, 75 $\Omega$ , unbalanced

Dubbing input: Luminance signal: 0.5 Vp-p  
Sync negative,  
Impedance: 75 $\Omega$   $\pm$  10%  
Chroma signal: 0.5 Vp-p  
Impedance: 75 $\Omega$   $\pm$  10%

Dubbing output: Luminance signal: 0.5 Vp-p  
Sync negative,  
Impedance: 75 $\Omega$   $\pm$  10%  
Chroma signal: 0.5 Vp-p  
Impedance: 75 $\Omega$   $\pm$  10%

Horizontal resolution: 370 lines (monochrome mode)  
260 lines (color mode)

Signal to noise ratio: More than 46 dB  
(monochrome mode)  
More than 46 dB (color mode)

##### AUDIO:

Input: (MIC)  
-60 dB, 3 k-ohms, balanced  
(matches 600 ohm microphones)  
(LINE)  
+4 dB, 10 k-ohms/600 ohms, balanced

Output: (LINE)  
+4 dB, low impedance, balanced  
(600 ohm load permissible)  
(HEADPHONES)  
-46 to -26 dB, 8 ohms load, binaural  
(MONITOR)  
+4 dB, 600 ohm load, balanced

Distortion: Less than 2.0% (1 kHz reference level)

Frequency response: 50 Hz to 15 kHz

Signal to noise ratio: 48 dB (at 3% distortion level)

##### TIME CODE

Input: 0 dB  $\pm$  6 dB, 10 k-ohms, unbalanced (0 dB = 1.55 Vp-p pulse)

Output: 0 dB  $\pm$  3 dB, low impedance, unbalanced (0 dB = 1.55 Vp-p pulse)

##### SC

Input: 2 Vp-p  $\pm$  1 V, 75 ohms, unbalanced

##### SYNC

Input: 0.2 Vp-p to 5 Vp-p, negative, 75 ohms, unbalanced (1 Vp-p  $\pm$  0.2 V with VIDEO input)

##### RF output (OFF TAPE):

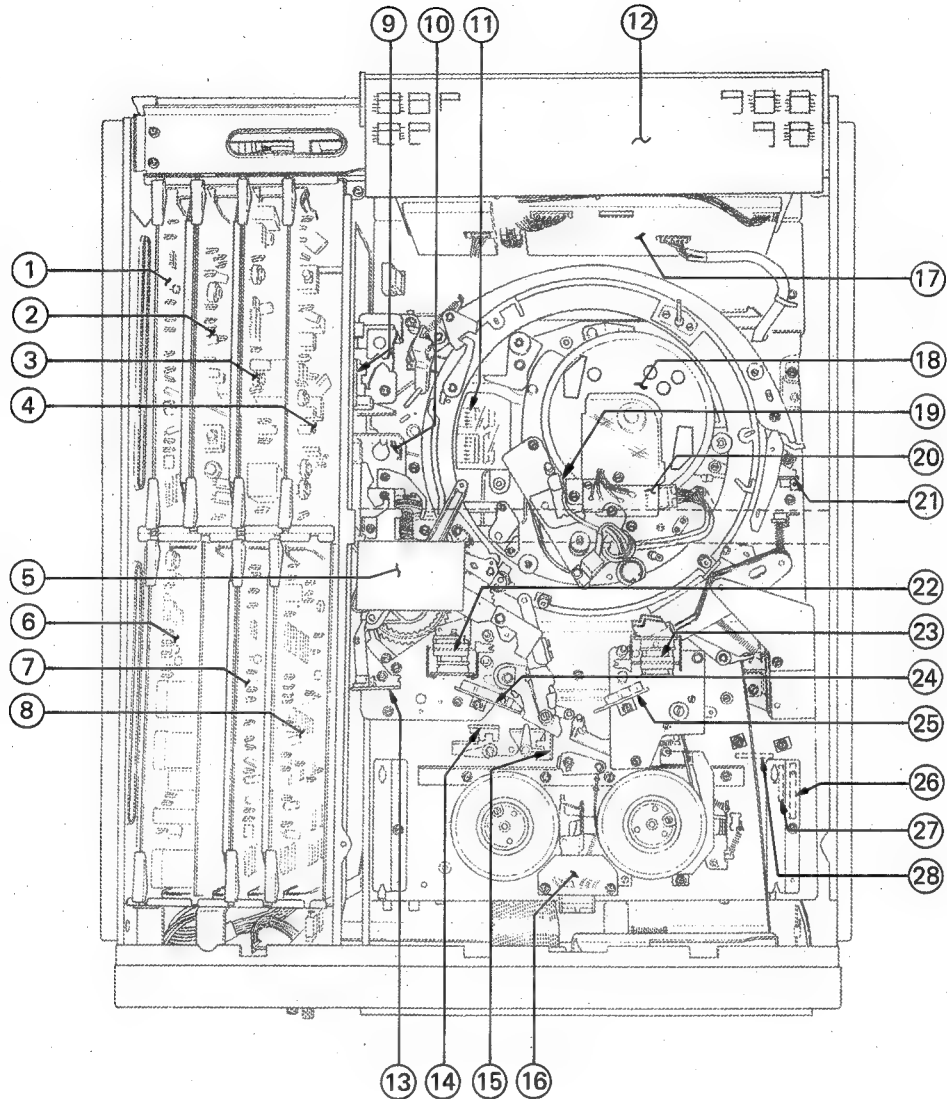
0.5 Vp-p  $\pm$  0.1 V, 75 ohms, unbalanced



### 3-2. LOCATION OF MAIN PARTS

#### 3-2-1. Location of the Printed Circuit Boards

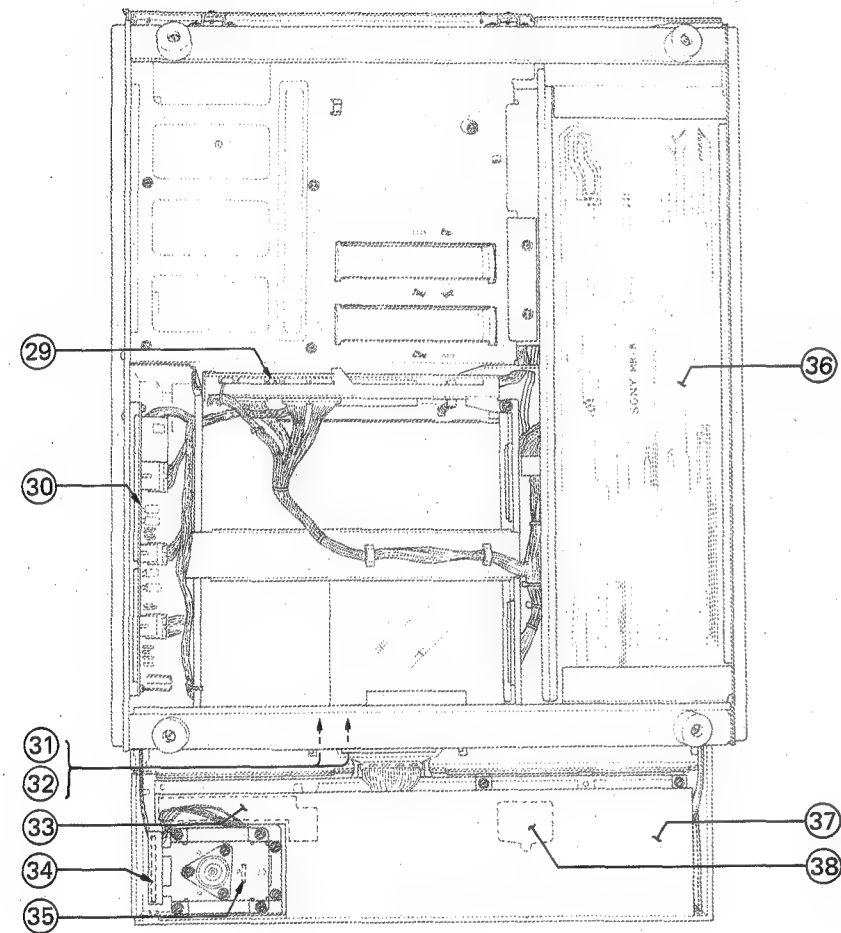
< TOP VIEW >



- |                  |  |
|------------------|--|
| ① TC-13 BOARD    | ⑮ PC-7 (A) BOARD                             |
| ② CD-20 BOARD    | ⑯ EM-1 BOARD                                 |
| ③ YD-14 BOARD    | ⑰ RP-10 BOARD                                |
| ④ MD-18 BOARD    | ⑱ DA-6 BOARD                                 |
| ⑤ FC-10 BOARD    | ⑲ TC-12 BOARD                                |
| ⑥ AU-13 BOARD    | ⑳ SR-17 BOARD                                |
| ⑦ RS-3 BOARD     | ㉑ EK-2 (B) BOARD                             |
| ⑧ SV-52 BOARD    | ㉒ TAKE-UP SIDE TENSION DETECTOR              |
| ⑨ EK-3 BOARD     | ㉓ SUPPLY SIDE TENSION DETECTOR               |
| ⑩ TM-8 BOARD     | ㉔ PC-12 BOARD                                |
| ⑪ TM-4 BOARD     | ㉕ PC-8 BOARD                                 |
| ⑫ DT-3 BOARD     | ㉖ CC-9 BOARD (with Cassette-up Compartment)  |
| ⑬ EK-2 (A) BOARD | ㉗ CC-11 BOARD (with Cassette-up Compartment) |
| ⑭ PC-7 (B) BOARD | ㉘ CC-10 BOARD (with Cassette-up Compartment) |

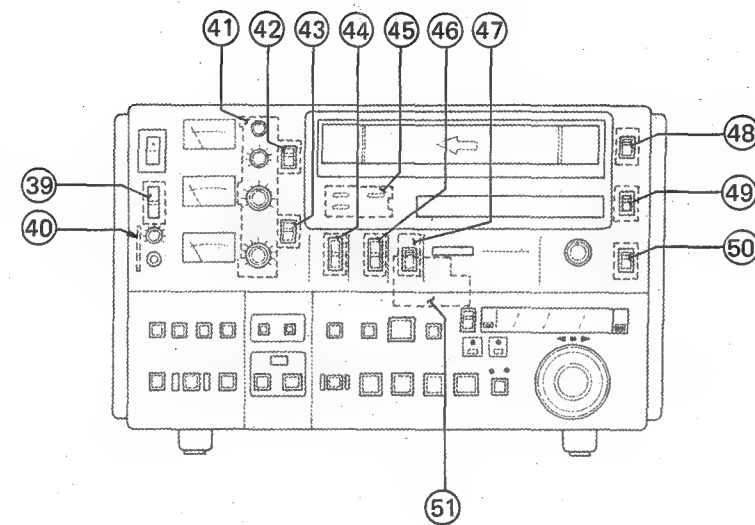


< BOTTOM VIEW >



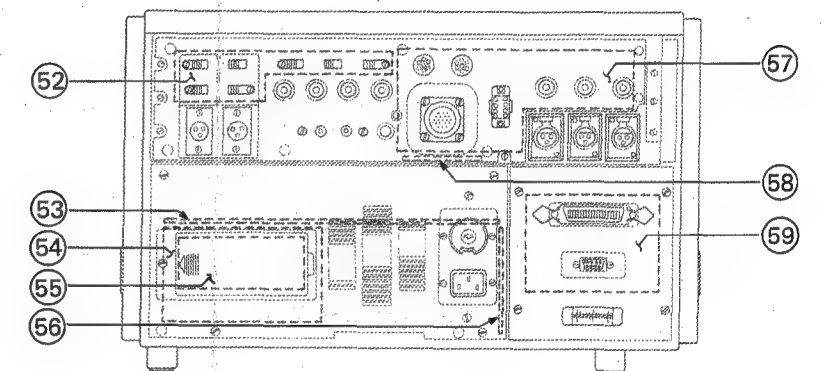
- ②⑨ MB-9 BOARD
- ③① SY-71 BOARD
- ③② SY-92 BOARD
- ③③ SY-37 BOARD
- ③④ DP-9 BOARD
- ③⑤ PC-9 BOARD
- ③⑥ PC-14 BOARD
- ③⑦ MB-36 BOARD
- ③⑧ KY-9 BOARD
- ③⑨ KY-14 BOARD

< FRONT VIEW >



- ③⑨ AO-2 BOARD
- ④① HP-5 BOARD
- ④② MF-1 BOARD
- ④③ LV-1 BOARD
- ④④ MS-5 (A) BOARD
- ④⑤ MS-5 (B) BOARD
- ④⑥ WL-1 BOARD
- ④⑦ MS-5 (C) BOARD
- ④⑧ MS-5 (D) BOARD
- ④⑨ MS-5 (E) BOARD
- ⑤① MS-5 (F) BOARD
- ⑤② PR-33 BOARD
- ⑤③ RE-3 BOARD

< REAR VIEW >

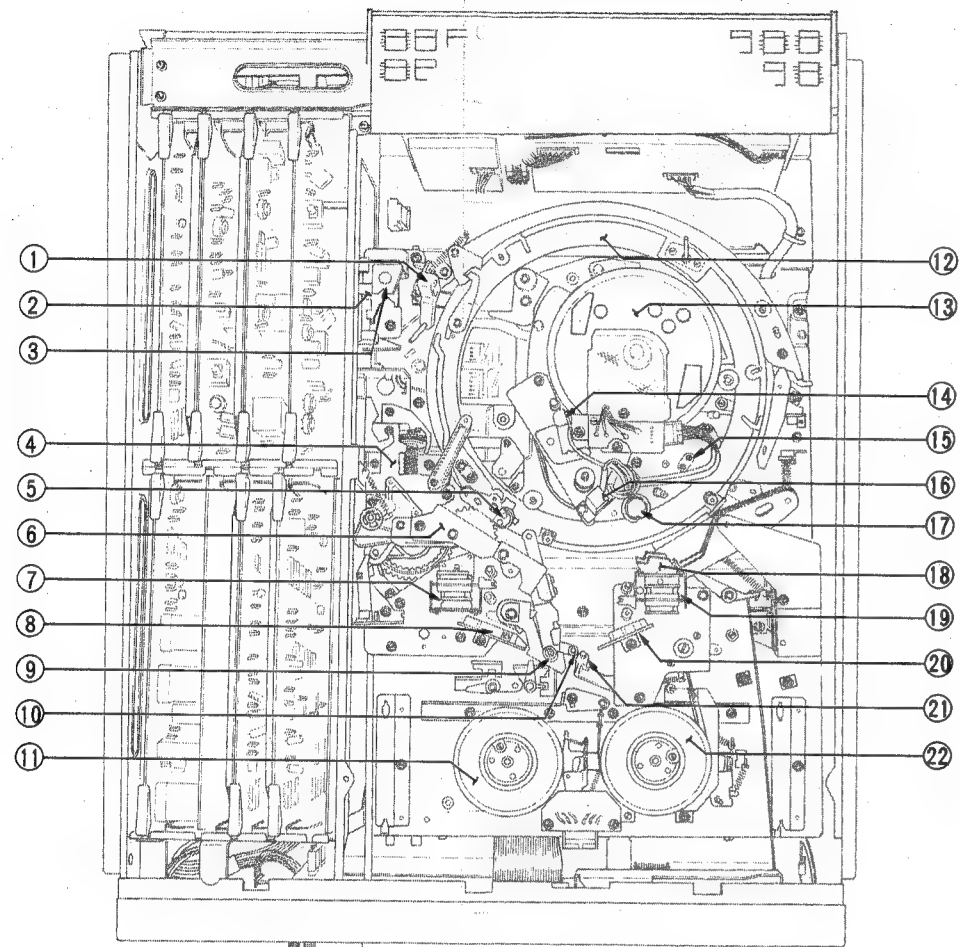


- ⑤② SA-9 BOARD
- ⑤③ PD-19 BOARD
- ⑤④ PW-79 BOARD
- ⑤⑤ FU-16 BOARD
- ⑤⑥ PW-50 BOARD
- ⑤⑦ AO-3 BOARD
- ⑤⑧ TM-14 BOARD
- ⑤⑨ RM-4 BOARD



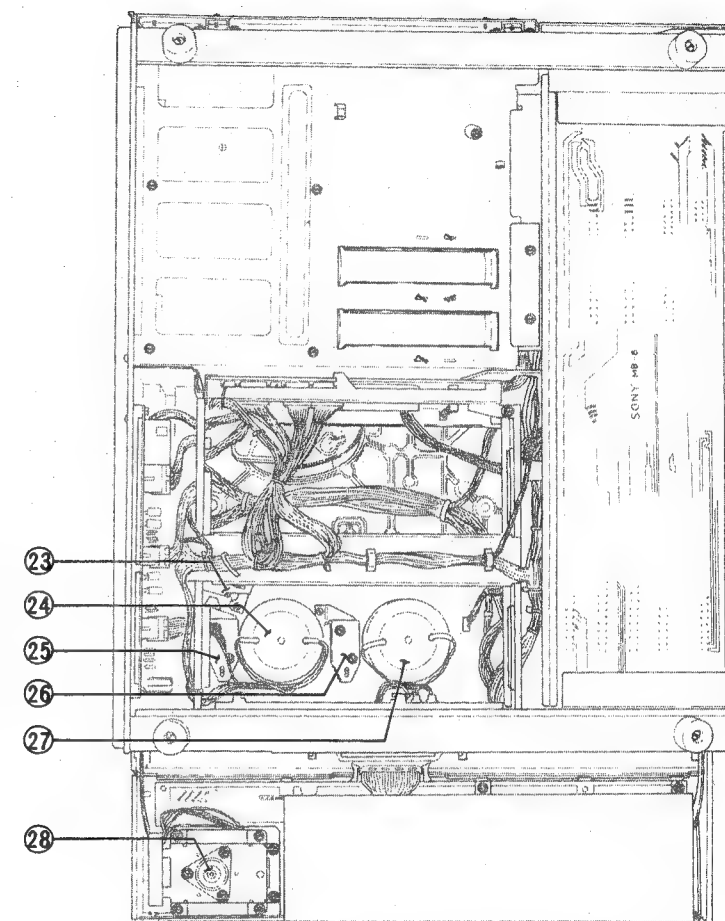
### 3-2-2. Location of the Mechanical Main Parts/Components

< TOP VIEW >



- |                                       |                                      |
|---------------------------------------|--------------------------------------|
| ① Threading Slider                    | ⑫ Threading Ring                     |
| ② Thread End 1 Block                  | ⑬ Head Drum                          |
| ③ Threading V Shaped Block            | ⑭ Time Code Head                     |
| ④ Threading Gear Block                | ⑮ Audio/CTL Head                     |
| ⑤ Pinch Roller                        | ⑯ Full Erase Head                    |
| ⑥ Threading Arm                       | ⑰ Capstan Shaft                      |
| ⑦ Take-up Side Tension Detector Block | ⑱ Pinch Lever                        |
| ⑧ Tape Beginning Detector Block       | ⑲ Supply Side Tension Detector Block |
| ⑨ Threading Guide                     | ⑳ Tape End Detector Block            |
| ⑩ Take-up Tension Arm                 | ㉑ Supply Tension Regulator Arm       |
| ⑪ Take-up Reel Table                  | ㉒ Supply Reel Table                  |

< BOTTOM VIEW >



- |                                     |
|-------------------------------------|
| ㉓ S Tension Solenoid Block          |
| ㉔ Supply Reel Motor                 |
| ㉕ Supply Reel Brake Solenoid Block  |
| ㉖ Take-up Reel Brake Solenoid Block |
| ㉗ Take-up Reel Motor                |
| ㉘ Search Dial Block                 |



### 3-3. PRINTED CIRCUIT BOARDS

The circuit board information is provided below.

System	Circuit board	Circuit function
VIDEO	MD-18	• Luminance and chrominance signal modulator.
	RP-10	• REC/PB amplifier • Rotary erase amplifier
	DA-6	• DT head amplifier
	YD-14	• Luminance signal demodulator
	CD-20	• Chrominance signal demodulator
AUDIO	AU-13	• REC/PB amplifier • Audio system control
	AU-25	• Bias oscillator • CH-1/CH-2 erase oscillator
	SA-9	• Input impedance converter (high ↔ low)
	AO-2	• Audio monitor switch
	AO-3	• CH-1/CH-2 output amplifier • Monitor out selector/output amplifier
	HP-5	• Headphones level adj.
	SV-52	• Capstan/drum speed and phase servo
SERVO	CF-9	• CTL REC/PB amplifier • Color Framing
	RS-3 (RS-4)	• Tape tension detector • Reel motor driver control
	EM-1	• Reel rotation detector
	MD-18	• Blanking switcher
	FC-10	• When the set is put into the TBC mode and DT mode simultaneously, this circuit delays the switching pulse.
DYNAMIC TRACKING	DT-3	• Dynamic tracking
TIME CODE	TC-13	• Time code REC/PB amplifier • Automatic reference sync selector (for servo) • CTL counter (for display)
SYSTEM CONTROL	SY-9 <sup>~</sup>	• Function control
	SY-37	• System control micro processor
	SY-71	• Cassette compartment motor driver • Threading motor driver • Skew solenoid driver • Pinch solenoid driver • T brake solenoid driver • S brake solenoid driver • S tension regulator solenoid driver • Humidity detector
	KY-9 (KY-14)	• Key board with serial data ↔ parallel data converter
	DP-9	• Display
	PC-9	• Search dial
	PC-14	• Search dial

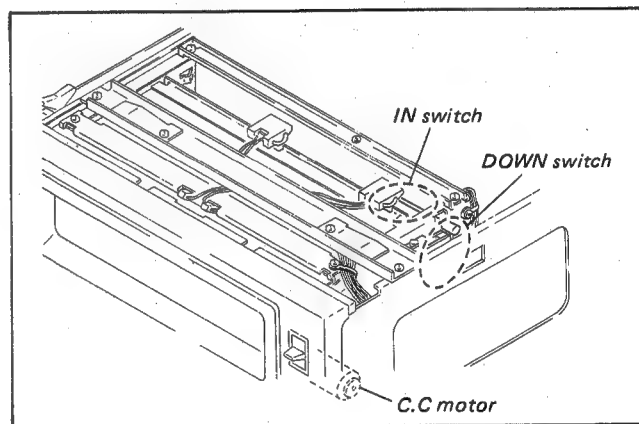
POWER DRIVER	PD-19 (PD-15, PD-17) (DR-9, DR-19) PD-21, BP-6	• Full erase oscillator • 12 V regulator • 5 V regulator • -12 V regulator • Drum motor power driver • Capstan motor power driver • Reel motor power driver • Dynamic tracking driver
POWER SUPPLY	PW-50	• Power supply
	PW-79	• Switching regulator
	FU-16	• Fuse

### 3-4. MECHANICAL OPERATION

#### 3-4-1. Cassette-in/Cassette-out Operation

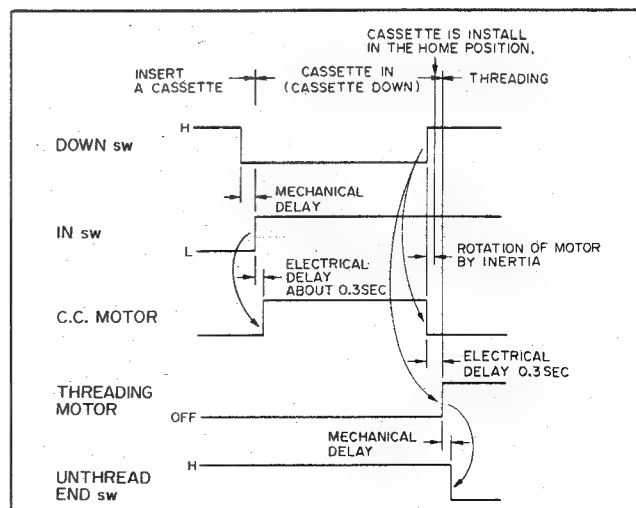
The cassette insertion system in the BVU-820P is a front access system. The cassette compartment drops automatically after the cassette tape has been inserted into the cassette compartment and threading action is started after the cassette is seated in the home position.

The timing chart of the photoelectric sensor and the motor are as follows:



#### (1) Cassette-in Operation

The timing of the Cassette Down switch (DOWN switch), the Cassette-in switch (IN switch), the Cassette Compartment motor (C.C. motor), the Threading motor, and the Unthreading End switch in the cassette-in operation are as follows:





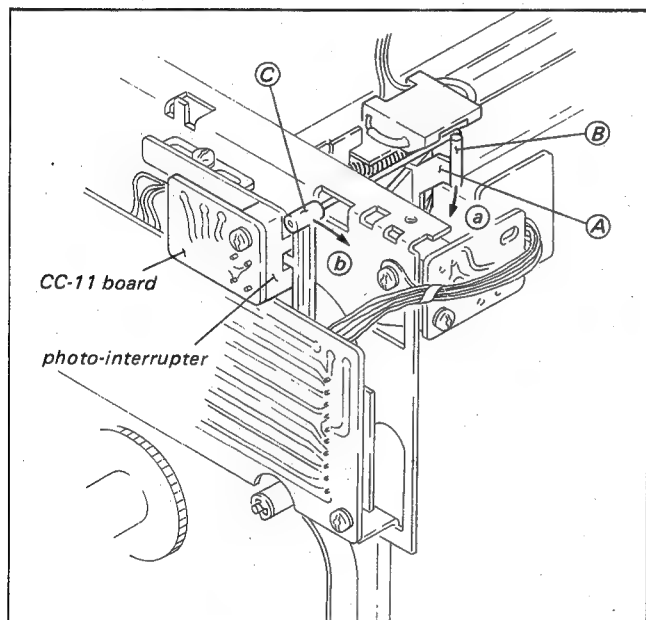
- The DOWN switch and the IN switch are turned to "H" or "L" in the manner stated below and the C.C. motor operate as follows:

(i) DOWN switch

The cassette tape is inserted by hand and then the cassette pushing lever (called (A) for making the sentence simple) moves in the direction indicated by arrow (a).

The down switch arm (called (C)) which has been held by the pin (called (B)) of the (A) moves in the direction shown by arrow (b) with the movement of (A), and the shutter of (C) opens the photo-interrupter on the CC-11 board.

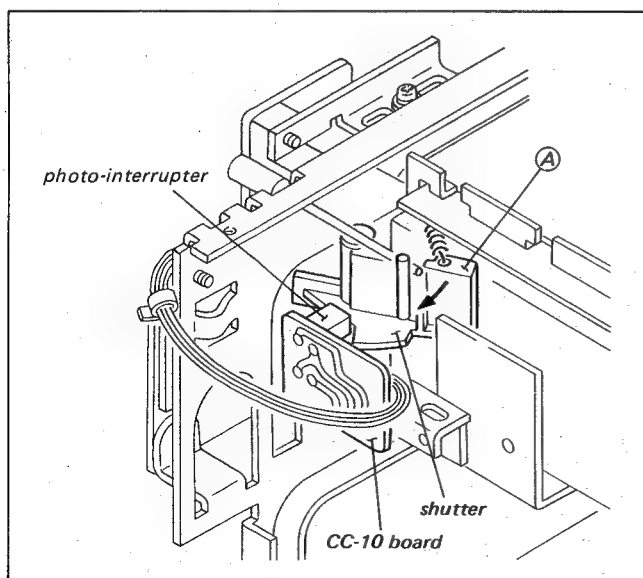
Then the DOWN switch turns to "L".



(ii) IN switch

The cassette tape is inserted by hand further after the DOWN switch operates (until the cassette is stopped).

The (A) shutter covers the photo-interrupter on the CC-10 board and the IN switch turns to "H".



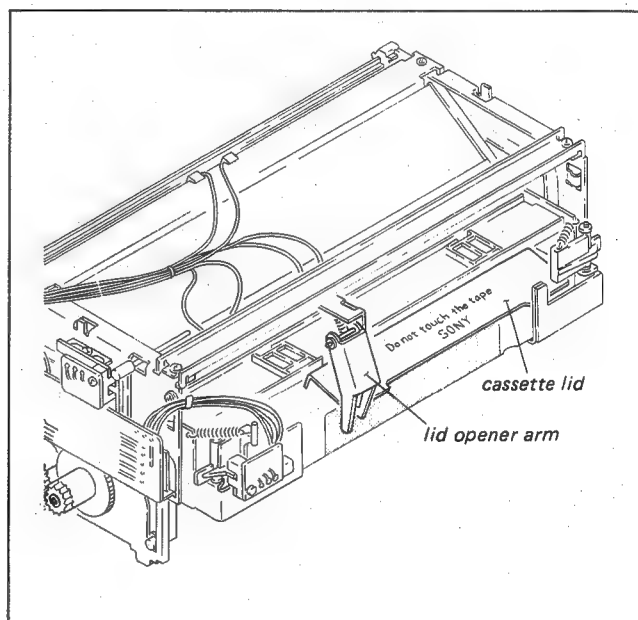
(iii) C.C. motor

When the IN switch turns to "H" after the cassette insertion, about 11.3 V from the SY-71 board is impressed on the C.C. motor via the CC-9 board and the motor starts. The power of the motor moves the cassette compartment through the belt and the gears.

(iv) Cassette tape lid opener

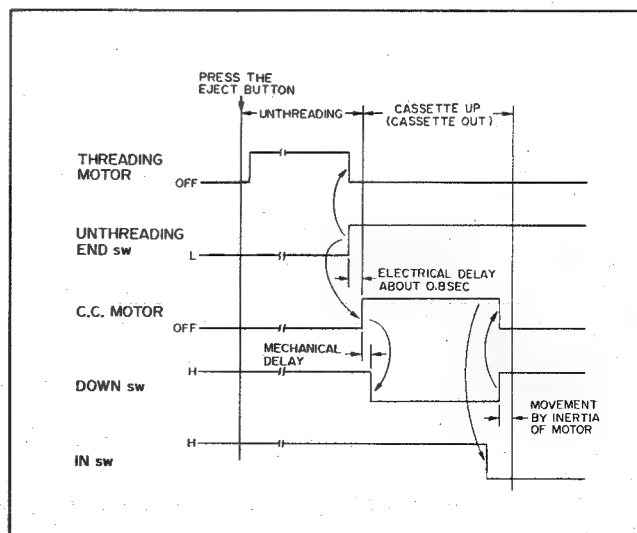
When the cassette tape is inserted, the C.C. motor rotates, and the cassette compartment moves.

The lid opener arm holds the bottom section of the cassette lid at the point where the horizontal movement of the cassette compartment changes to the vertical movement. The lid is opened following with the downward movement of the cassette compartment.



(2) EJECT Operation

The timing of the Threading motor, the Unthreading End switch, the C.C. motor, and the IN switch in the eject operation are as follows:





### (3) Protection Circuit

- (i) If the cassette tape is removed forcibly when the cassette tape is dropping, the IN switch turns to "L", puts the machine into the EJECT mode, the C.C. motor rotation is reversed, and the cassette-up operation takes place.
- (ii) If the cassette tape after the cassette-up is pushed in by hand forcibly in the rear direction, the C.C. motor rotates 5 seconds in reverse direction after the cassette-up and the cassette-down operation take place again (for preventing the C.C. motor from burning). And if the drop and rise time of the cassette compartment takes more than about 5 seconds, it is assumed that the cassette compartment is blocked by something and the motor rotation is stopped.
- (iii) The motor drive circuit operates only about 2 seconds in the cassette-up or the cassette-down operation.

### 3-4-2. Threading and Unthreading Operation

The cassette compartment drops automatically after the cassette tape is inserted into the cassette compartment.

When the cassette tape is placed into the home position, the threading arm moves, and the tape will be drawn out from the cassette. At this point, the threading arm moves to thread the tape around the drum.

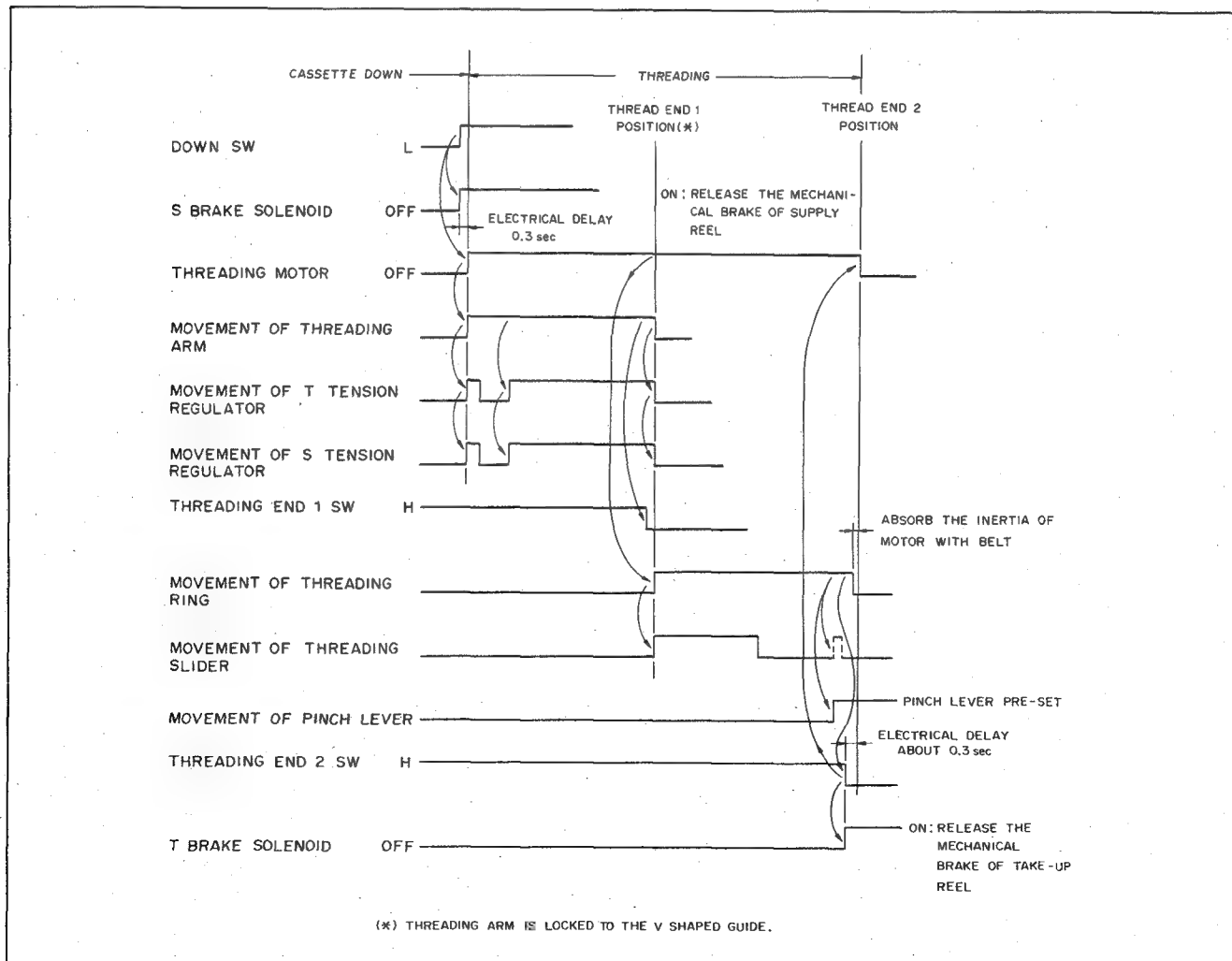
In the threading operation, the tape is drawn from the supply reel. In the unthreading operation, the tape is rewound onto the supply reel (when the set condition is normal), but the tape is taken up by the take-up reel when the set is in the states as mentioned below.

- When the power is turned ON while the tape is threaded, all condition will wake up as tape being threaded. (When the power is turned ON, the set goes through unthreading motion and then the threads again.)
- When the AUTO-OFF lamp turns ON. (Condensation is caused on the head drum.) (The set is forcibly placed into the EJECT mode.)
- When the tape tension detector detects a slacken tape or an excessively high tension. (In the tape protection mode.) (In the threading completion state (it is called threading end mode), the set is placed into the STOP mode once and, if the tape protection signal exists for more than 2 seconds in the STOP mode, the EJECT mode is set up forcibly. When the tape protection signal is generated in the threading or the unthreading mode, the set is placed into the EJECT mode.)

#### (1) Threading Operation

The operational timing of the electronic switches, the motor, and the ring are shown below.

#### (THREADING OPERATION)

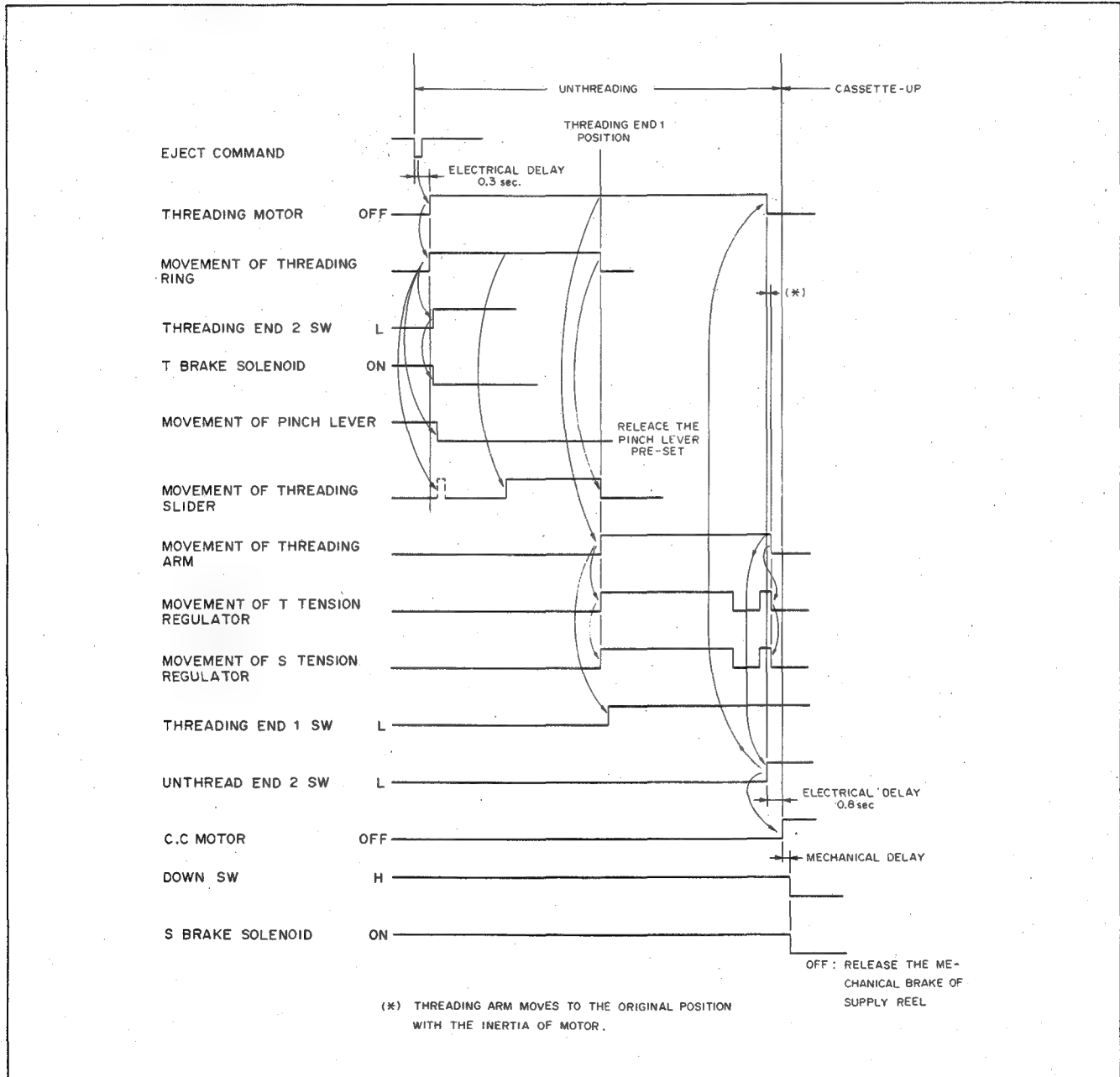




(2) Unthreading Operation

The operational timing of the electronic switches, the motor, the tape guide, and the ring are as follows. If the THREADING DISABLE or TAPE PROTECTION signal is generated, the eject operation is stopped.

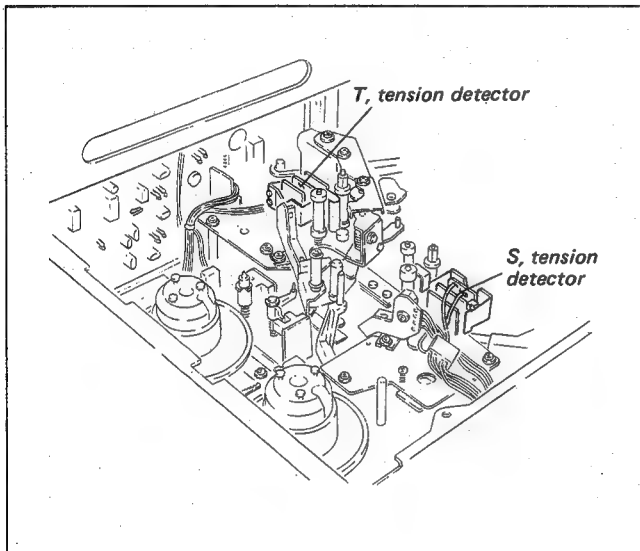
(UNTHREADING OPERATION)





### 3-4-3. Electrical Tape Tension Detector

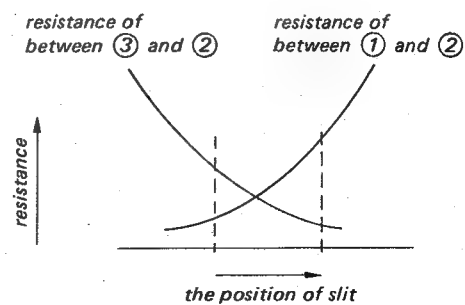
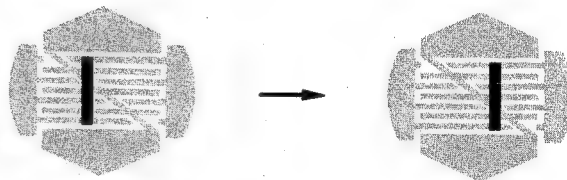
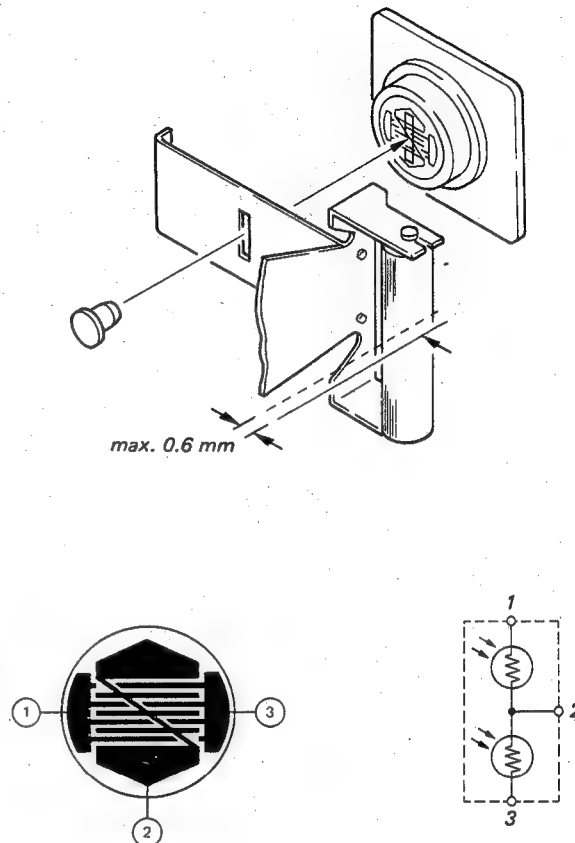
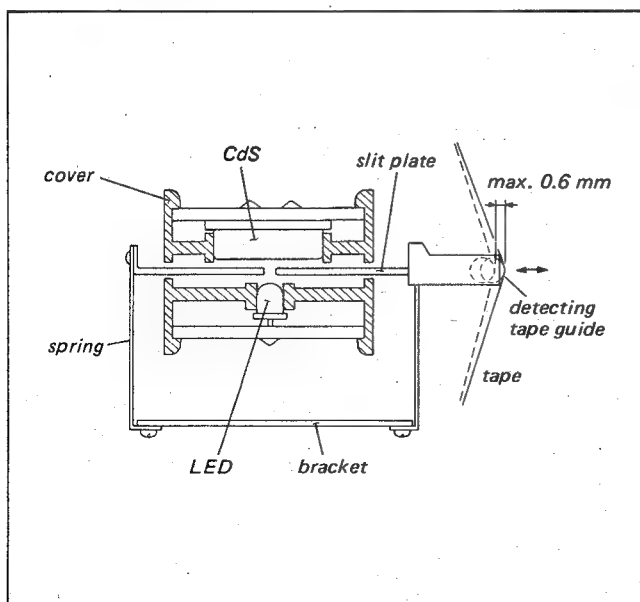
The BVU-820P has two tension detectors. One is placed near the tape entrance side of the cassette tape and the other near the exit for providing an optimum tape tension. The fundamental mechanism of the tension detector is as follows.



#### (1) Fundamental Mechanism

The fundamental mechanism of the tension detector is shown in the figure. The light emitted by an LED is received by the CdS detection element through a slit on the slit plate connected directly to the tape guide. The electrode's pattern of this CdS is shown in the figure. The slit moves with the tape tension change and the point where the light reflector moves. Then the resistance values between ① - ② and the resistance between ③ - ② are vary. The tape tension around the tension detector tape guide is detected by the resistance variation.

This resistance variation output controls the reel motor torque, and the tape tension is controlled.





(2) Actual Operation

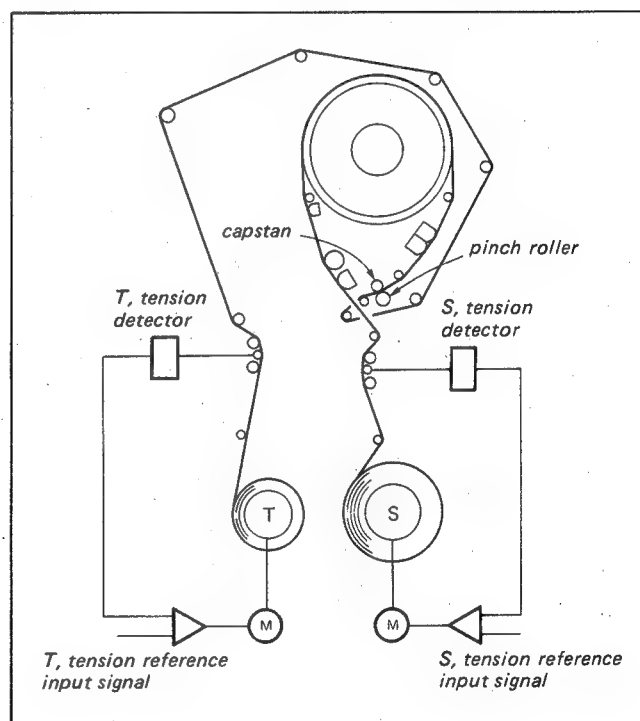
The movable distance of the tape guide directly connected to the slit plate is adjusted with the stopper from 0 to 0.6 mm. The 0 point and the sensitivity of the detecting operation are set with variable resistors on the RS-4 board. The tape tension, when the tape guide moves about 0.6 mm, corresponds to about 300 grams. If 43 grams or more tension is applied on the supply side tension detector in the F-FWD mode, 43 grams or more tension on the take-up side tension detector in the REW mode, on 255 grams or more tension is applied on the supply side and the take-up side tension detectors in the modes other than the above, the BVU-820P considers to have abnormal tension and will go into the stop mode to protect the tape.

On the other hand, when the tension applied on the tape is less than 8 grams, it is regarded to have a tape slack and the auto stop mode is set up in any mode for the tape protection.

### 3-4-4. FWD, REV, SHUTTLE, JOG Operation

(1) Tension Servo System

The tension servo loops shown in the figure function independently for the supply and the take-up motor in the FWD (excepting the modes set up by pressing the PLAY button, i.e., the REC mode and the x1 SPEED PLAY mode), REV, SHUTTLE, JOG, STILL and the STOP mode. Thus the tape tensions on the supply and the take-up side are controlled to the optimum conditions at the all time. The tape tension on the supply side is controlled by the mechanical tension control mechanism comprised from the tension arm, the brake band, and the supply reel table in the modes set up by the PLAY button, that is, in the REC mode and the x1 SPEED PLAY mode. In this case, the power is not supplied to the supply reel motor. The tape tension on the take-up side in the REC mode and the x1 SPEED PLAY mode is controlled to optimum condition by the tension servo loop as well as in the FWD (excepting the REC and the x1 SPEED PLAY mode), REV, SHUTTLE, JOG, STILL, and the STOP mode.





(2) Timing Chart

The timing of the S tension solenoid, pinch solenoid, and the rotation of the capstan motor in the FWD, REV, SHUTTLE, and the JOG mode are shown below. There are two method for the mode switching from the PLAY to the SHUTTLE; One is by pressing the SHUTTLE button and the other is by not pressing the SHUTTLE button. The two method are described here separately. Please refer to page 2-8, for the switching the two ways.

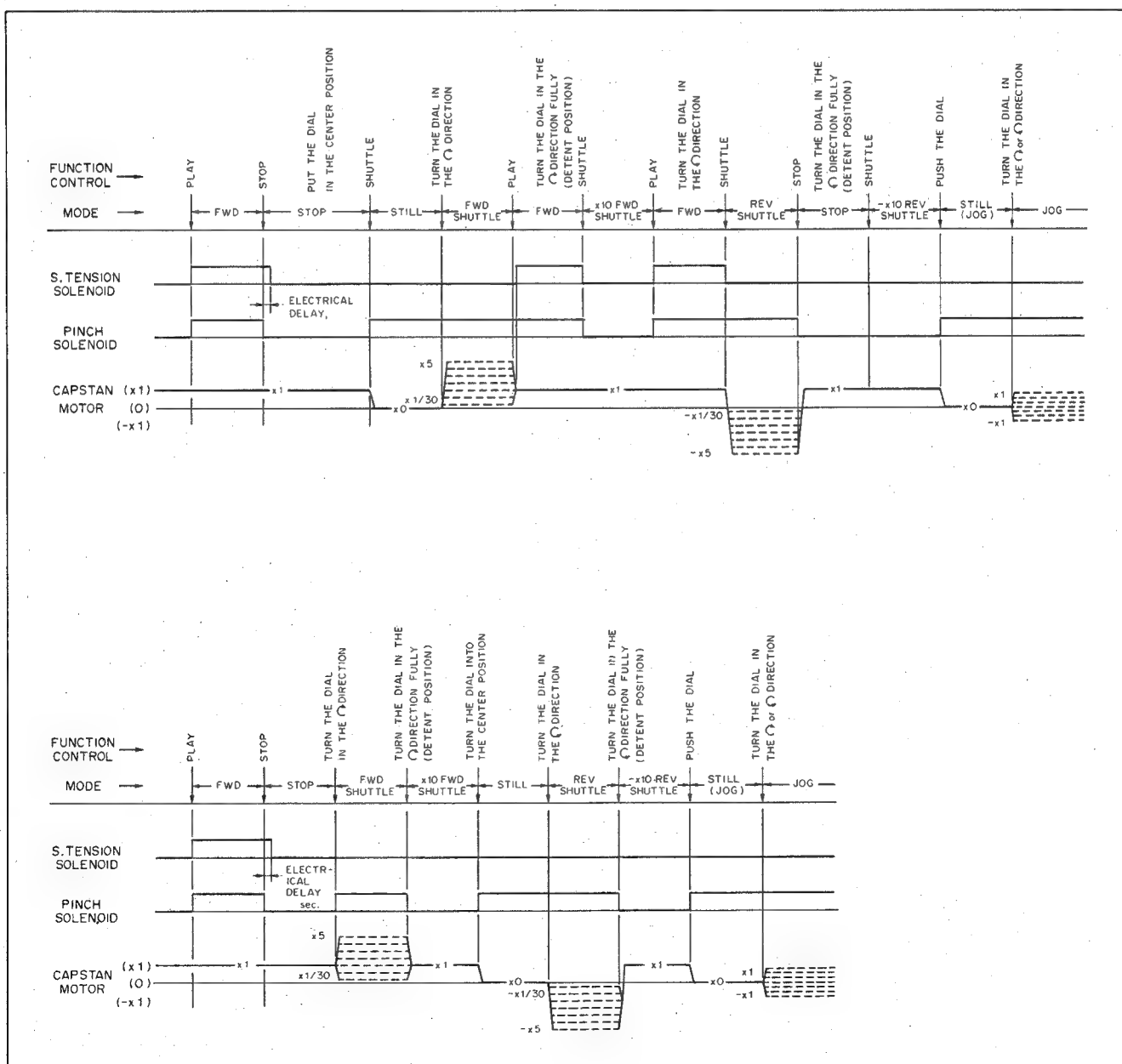
When the DT SELECT switch on the front panel is set in the SEARCH or OFF position, the tape speed in the SHUTTLE operation by using the SEARCH DIAL can be switched to 16 steps to 0,  $x\pm1/30$ ,  $x\pm1/10$ ,  $x\pm1/5$ ,  $x\pm1/2$ ,  $x\pm1$ ,  $x\pm2$ ,  $x\pm5$ ,  $x\pm10$ .

In the steps from the  $x\pm1/30$  to  $x\pm5$  speed, the pinch roller is engaged and the tape is driven by the capstan.

In the  $x\pm10$  speed (the SEARCH DIAL is at the detent position), the pinch roller is not engaged and the tape is driven by the supply or the take-up reel.

When the DT SELECT switch is set in the VAR position, the tape speed in the SHUTTLE operation by using the SEARCH DIAL can be switched to 12 steps to  $x-1$ ,  $x-1/2$ ,  $x-1/5$ ,  $x-1/10$ ,  $x-1/30$ , 0,  $x+1/30$ ,  $x+1/10$ ,  $x+1/5$ ,  $x+1/2$ ,  $x+1$ ,  $x+2$ ,  $x+3$ . In all speed, the pinch roller is engaged and the tape is driven by the capstan.

In the JOG operation, the tape speed can be changed from 0 to  $x\pm1$  and the tape is driven by the capstan.





### 3-4-5. F. FWD and REW Operation

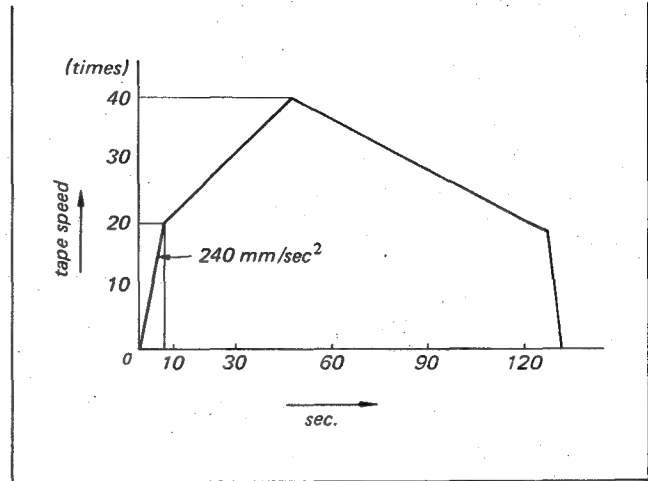
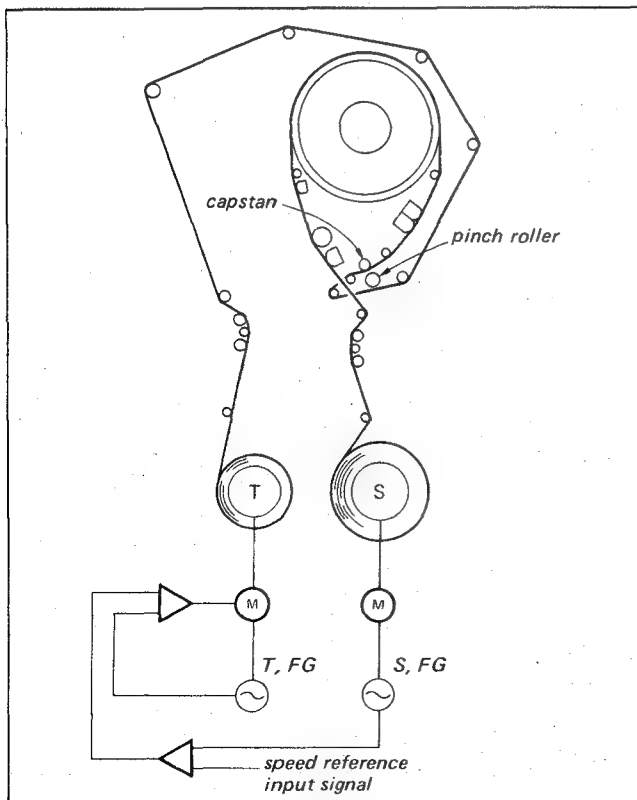
In the F. FWD and the REW operation, the pinch roller is disengaged and the tape is moved by the take-up or the supply reel motor at a high speed.

The reel servo makes the speed servo and the tension servo work on the basis using the detected signals from the tension detectors on the take-up and the supply side and the rotation numbers detected by the DMEs (Divided Type Magnetoresistance Element) near by the take-up and the supply reel table. Then the tape tension and the rotation numbers of the reel table are controlled by the speed servo and the tension servo.

The reel servo system in the F. FWD mode is identical with the one in the REW mode and the servo operation in the F. FWD mode is described here.

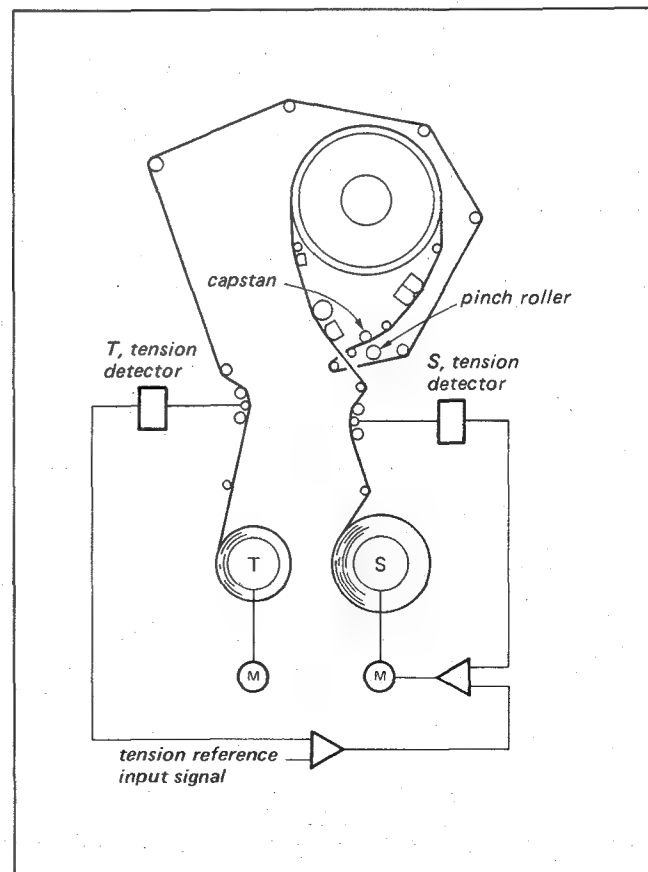
#### (1) Speed Servo System

- The speed servo system is designed as shown in the following block diagram.
- The take-up side FG and the take-up reel motor makes a minor servo loop. In this case the reference input signal is made from the error signal from the revolution speed of the supply reel table and the other reference input signal. Therefore the rotation numbers of the supply reel table from the tape is controlled for constant speed.
- The system regulates the revolution speed of the supply reel of the tape in the F. FWD mode so that the tape overrun becomes minimal (the leader tape does not come into contact with the head drum) when the auto stop mode is set up at the end of the tape and the brake is applied on the reel.
- The speed servo system is designed with above two main loops.



#### (2) Tension Servo System

- The tension servo system is designed as shown in the following block diagram.
- The supply side tape tension is detected by the tension detector. And this signal is fed back to the supply reel motor torque.
- The reference input signal of the tape tension is made from the error signal of the tension detector output signal and the other reference input signal of the tape tension.

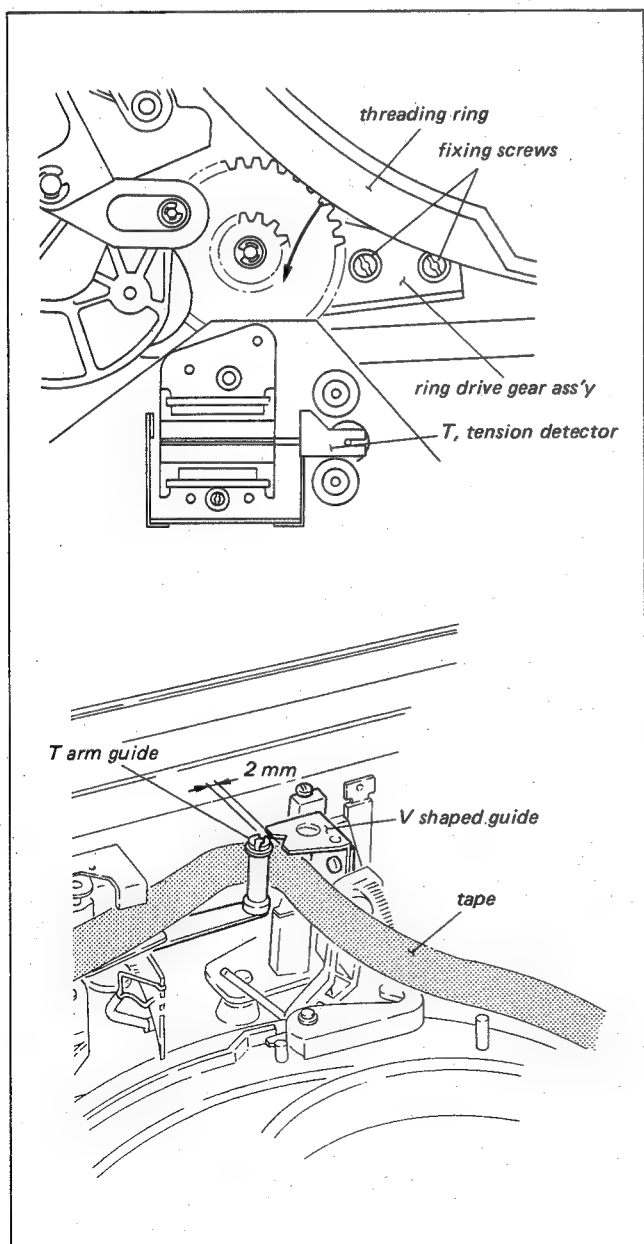




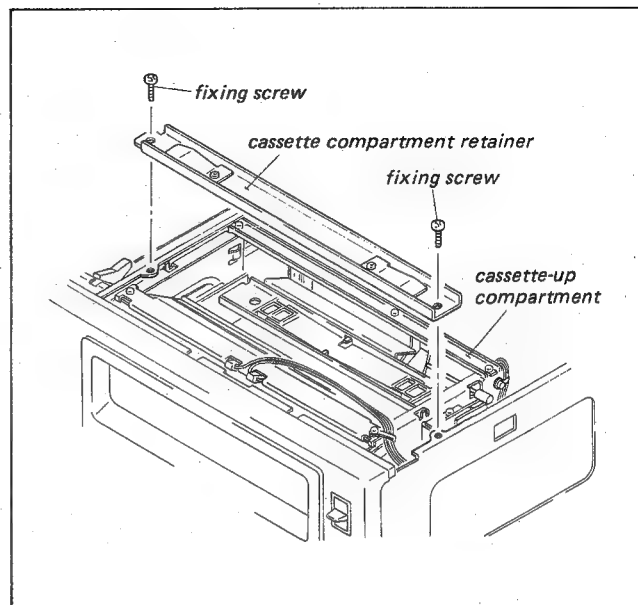
### 3-5. CASSETTE REMOVAL PROCEDURE WHEN NORMAL EJECTION IS NOT POSSIBLE

If the eject operation becomes impossible due to trouble or the cassette-up compartment does not rise when the eject operation takes place, the cassette tape can be removed from the set by the procedures described below.

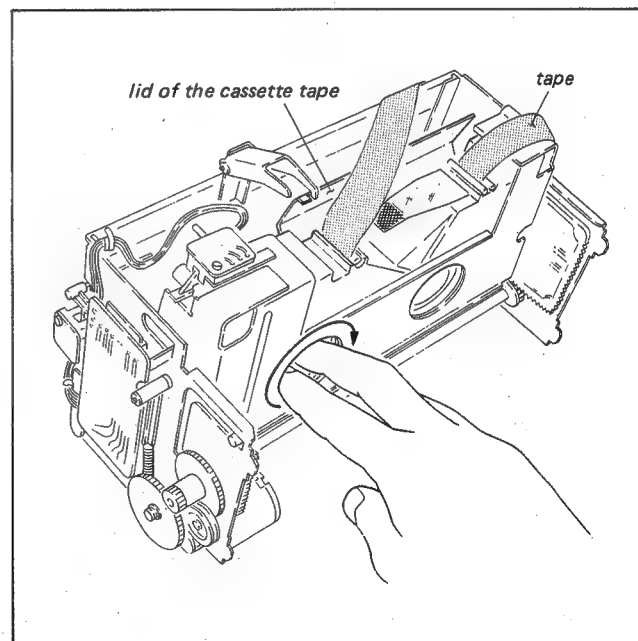
1. Remove the upper panel.
2. Loosen the ring drive gear assembly two mounting screws. And move the ring drive gear assembly in the arrow direction. Turn the threading ring by hand in the counterclockwise direction until the T arm guide moves away about 2 mm from the V shaped guide.  
(The threading ring and the threading slider move in the unthreading direction. But the tape remains at the position of the threading completion.)



3. Remove the cassette compartment retainer and disconnect the connector on the CC-9 board.

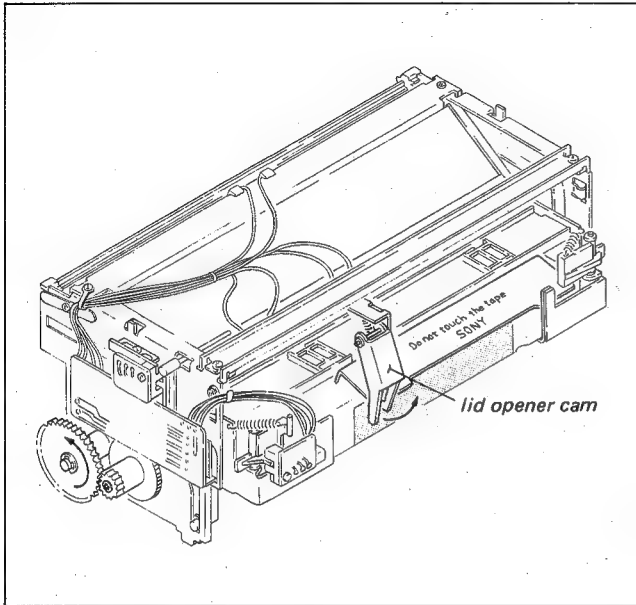


4. Bring up the cassette compartment with the cassette tape in it slowly. Remove the tape remaining in the set carefully so that it does not damage.
5. Hold the cassette tape lid so that it does not close. Wind the tape into the cassette tape by turning the reel hub on the back of the cassette tape with finger.





6. Raise the cam for opening the lid and close the cassette tape lid.



7. Remove the tape from the cassette compartment.
8. Turn the gear on the right side of the cassette compartment counterclockwise direction by hand in order to place the cassette compartment into the up state.
9. Locate the cause of the trouble and remedy the problem.



## SECTION 4

### PERIODIC CHECK AND MAINTENANCE

It is recommended that the following periodic check and maintenance schedule be employed in order to obtain maximum performance and longer tape life from the BVU-820P.

#### 4-1. PERIODIC CHECK AND MAINTENANCE SCHEDULE

1. Perform the system control operation check in sec. 4-2 daily before the operation.
2. Perform the maintenance check described separately in accordance with the operating hours of the machine.  
The BVU-820P has an hours meter on the connector panel for the periodic check and the maintenance. The hours meter accumulates and records the elapsed time of all the modes in which the drum rotates while the tape is threaded (i.e., the FWD, REV, REC, SHUTTLE, and JOG modes). It is recommended that the hours meter is used as a tool for determining the periodic check. When the hours meter indicates the maximum value, 1000 hours, the hours meter must be replaced with a new one.  
(SONY Part No.: 1-548-141-41)

3. It is recommended to perform the following checks and adjustments after the machine whose operational hours reach 200, 500, 750, and 1000 hours in order to obtain good quality picture.

If it is not to meet the specifications, perform the upper drum assembly replacement.

**NOTE:** Video head life is effected extensively by operating ambient conditions.

13-1-1. ~ 13-1-2.

Playback Amplifier Adjustment

13-1-5. Y-RF Output Balance/Level Adjustment

13-1-6. Chroma-RF Balance/Level Adjustment (R/P HEAD)  
Chroma-RF Balance/Level Adjustment (DT HEAD)

13-5-2. Y Record Current Adjustment

13-5-3. Chroma Record Current Adjustment

14-1. Rotary Erase Current Adjustment

○ : Cleaning    ◇ : Check    ◆ : Replacement

Item	Part No. of replacement part	Operating Hours (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Tape path cleaning (including the video heads)	—	○	○	○	○	○	○	○	○	○	○	Perform whenever repair work is attempted
Check and adjustment of the supply side and the take-up side tension detector	—	◇	◇	◇	◇	◇	◇	◇	◇	◇	◇	
Replacement of the pinch roller (When the BVU-820P is used as the editing machine)	A-6750-113-D ARM ASS'Y, PINCH	—	◆	—	◆	—	◆	—	◆	—	◆	
Replacement of the pinch roller (When the BVU-820P is used as the playback machine (such as on air))	A-6750-113-D ARM ASS'Y, PINCH	—	—	—	◆	—	—	—	◆	—	—	
Check the FWD back tension (Replacement of the brake band)	X-3668-045-0 BAND ASS'Y, BRAKE	—	◇	—	◆	—	◇	—	◆	—	◇	
Check the brake torque (Replacement of the brake shoe)	X-3642-166-0 SHOE ASS'Y	—	—	—	◇	—	—	—	◆	—	—	
Replacement of the belt of the threading motor assembly	3-668-173-00 BELT (3), LM	—	○	—	○	—	○	—	◆	—	○	
Replacement of the belt of the cassette compartment	3-653-387-00 BELT, LM	—	—	—	—	—	—	—	◆	—	—	
Replacement of the brush of the slip-ring assembly	3-607-104-00 BRUSH or A-6709-360-A BRUSH (4) ASS'Y	—	—	—	—	—	—	—	◆	—	—	

**NOTE:** Regarding overhaul of equipment.

When overhaul of an equipment is attempted, replace parts referring list. For the parts not listed in the following list, such as motors and stationary heads, refer the following items.

reel motor:	about 3,000 H
capstan motor:	about H
cassette compartment motor:	about H
threading motor:	about H
audio/CTL head:	about 3,000 H
erase head:	about 4,000 H
time code head:	about 4,000 H



4-2. SYSTEM CONTROL OPERATION CHECK

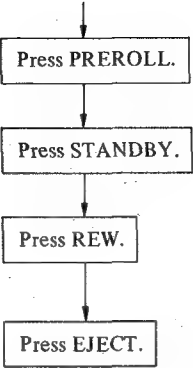
It is recommended that the following is checked daily before the operation.  
The check procedure described here is only for the BVU-820P but can be applied operation on the operation with the remote control unit.  
Note that the switches must be set according to the way the machine is used after the checks.

4-2-1. Play Back, F-FWD, REW, SHUTTLE, JOG and Preroll Function Check

- Thread a recorded tape (Video, Audio CH-1/CH-2). (Do not utilize an alignment tape.)
- Internal switch setting: The following are the procedures when the SEARCH DIAL switch on the SY-37 board is in the OFF position. When it is in the OFF position, the procedure indicated within the double lines is not necessary to perform. (Please refer to page 2-8 for further detail on this switch.)

With switches set to	Action	Check that
POWER : ON	Insert the cassette.	
REMOTE/LOCAL : LOCAL	Press F. FWD.	High speed the playback picture appears and the video and audio are not muted.
PB/PB/EE : PB	Press STOP.	A still picture appears.
AUDIO MONITOR : MIX	Press PLAY.	The playback picture appears. Audio CH-1 and CH-2 are present.
DT SELECT : OFF	Press SHUTTLE/JOG	
	Turn the Search dial to the right.	The playback speed changes from low to high. When the dial is turned to the position at which a click is felt, the machine enters into the fast forward mode (x10).
	Return the dial to the center position.	The still picture appears.
	Turn the Search dial to the left.	The reverse playback picture appears. The speed changes from low to high. When the dial is turned to the position at which a click is felt, the machine enters into the rewind mode (x10).
	Press the Search dial in.	The still picture appears.
	Press ENTRY and IN simultaneously.	IN lamp lights. (The edit-in point is memorized.)
	Turn the Search dial to the right.	The forward playback picture in the jog mode appears.
	Turn the Search dial to the left.	The reverse playback picture in the jog mode appears.

PB/PB/EE : PB/EE



The tape moves to 5 seconds prior to the edit-in point and stops. A still picture appears.

STANDBY lamp goes off.  
Only noise appears on the monitor.

The tape rewinds. The E-to-E mode picture appears. At the beginning of the tape, the tape stops automatically.

The cassette is ejected.



#### 4-2-2. Record Function Check

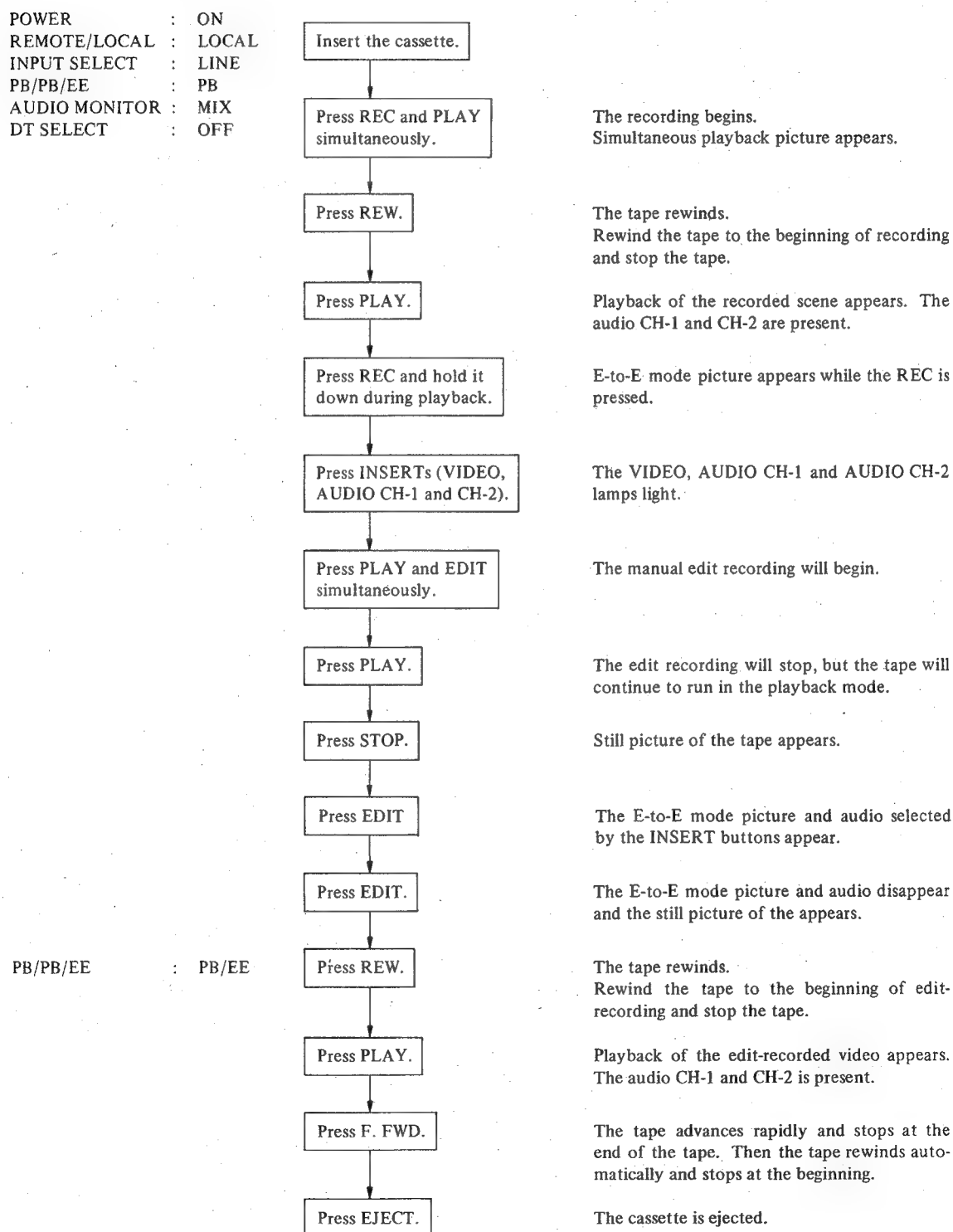
- Insert a video cassette tape on which recording can be made.
- Connect signals to the VIDEO IN, AUDIO IN CH-1 and CH-2 connectors.
- Connect a video and audio monitor.

##### With switches set to

POWER : ON  
 REMOTE/LOCAL : LOCAL  
 INPUT SELECT : LINE  
 PB/PB/EE : PB  
 AUDIO MONITOR : MIX  
 DT SELECT : OFF

##### Action

##### Check that



PB/PB/EE : PB/EE



#### 4-2-3. Editing Function Check

- Install a recorded tape (Video, Audio CH-1/CH-2). (Do not utilize an alignment tape).
- Apply the video and audio CH-1/CH-2 signals.
- The following is the procedure when the SEARCH DIAL switch on the SY-37 board is in the ON position.

With switches set to

POWER : ON  
 REMOTE LOCAL : LOCAL  
 AUDIO MONITOR : MIX  
 DT SELECT : OFF

Action

Check that

Insert the cassette.

Press PLAY.

Playback picture appears.

Press Search button.  
 (Search dial at ■ position)

The still picture appears.

Press ENTRY and IN  
 simultaneously.

Note the counter number of the point  
 (edit-in).

Locate a point for the edit-  
 out point with Search dial.

Press ENTRY and OUT  
 simultaneously.

Note the counter number of the point  
 (edit-out).

Press INSERTs (VIDEO,  
 AUDIO CH-1 and AUDIO  
 CH-2).

Press PREVIEW.

Previewing proceeds.

Press IN.

The counter of the edit-in point is  
 displayed.

While pressing IN, press  
 TRIM – ten times.

The counter decreases by ten frames.

Press OUT.

The counter of the edit-out point is  
 displayed.

While pressing OUT, press  
 TRIM + ten times.

The counter increases by ten frames.

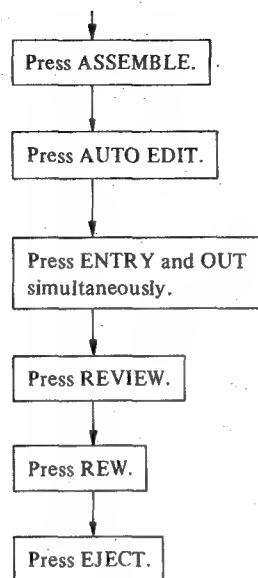
Press AUTO EDIT.

Auto edit recording proceeds.

Press REVIEW.

The reviewing of the edit recorded area pro-  
 ceeds.





The ASSEMBLE button lights.

The point where the AUTO EDIT has been pressed is entered as the edit-in point and auto edit recording begins.

The point is entered as the edit-out point and auto edit recording stops.

The reviewing of the edit recorded area is proceeded.

The tape stops at the beginning.

The cassette is ejected.

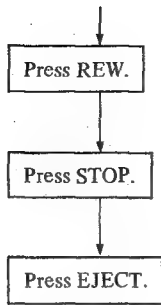


#### 4-2-4. Dynamic Tracking Function Check

- Thread a recorded tape (Video, Audio CH-1/CH-2). (Do not utilize an alignment tape.)
- Internal switch setting: The following are procedures when the SEARCH DIAL switch on the SY-37 board is in the OFF position. When it is in the OFF position, the procedure indicated within the double lines is not necessary to perform. (Please refer to page 2-8 for further detail on this switch.)

With switches set to	Action	Check that
POWER : ON	Insert the cassette.	
REMOTE/LOCAL : LOCAL	Press PLAY.	
PB/PB/EE : PB	Press SHUTTLE/JOG.	The playback picture appears. Audio CH-1 and CH-2 are present. (Keep the playback mode more than 8 minutes.)
AUDIO MONITOR : MIX	Turn the SEARCH DIAL to the right.	Noiseless playback picture in FWD SHUTTLE mode appears. The speed changes from low to high. (max. 3 times speed.)
DT SELECT : VAR	Return the DIAL to the center position.	Noiseless still picture appears.
MODE SELECT : TBC	Press the SEARCH DIAL in.	Noiseless still picture appears.
	Turn the SEARCH DIAL to the right.	The forward noiseless playback picture in the jog mode appears.
	Turn the SEARCH DIAL to the left.	The reverse noiseless playback picture in the jog mode appears.
	Press F•FWD.	High speed the playback picture with guard band noise appears.
	Press the SEARCH/JOG.	Noiseless still picture in the jog mode appears.





The tape rewind. The playback picture with guard band noise appears.

The still picture with guard band noise appears.

The cassette is ejected.



#### 4-3. MAINTENANCE AFTER REPAIRS

Perform the following maintenance after repair without regarding the machine operating hours.

1. Video heads and the rotary erase heads cleaning.  
(Referring sec. 4-5-1.)
2. Tape movement area cleaning.  
(Referring sec. 4-5-2.)

#### 4-4. FIXTURE FOR PERIODIC CHECK AND MAINTENANCE

J-6001-820-A	Drum Eccentricity Gauge (3)
J-6001-830-A	Drum Eccentricity Gauge (2)
J-6001-840-A	Drum Eccentricity Gauge (1)
J-6001-930-A	Drum Eccentricity Gauge (4)
J-6151-580-A	Dihedral Adjusting Screw (DT)
J-6009-830-A	Flatness Plate
Y-2031-001-0	Cleaning Fluid
2-034-697-00	Cleaning Piece
3-702-215-01	Torque Measurement Tape (100 mm dia.)
3-702-216-01	Back Tension Adjustment Jig
7-732-050-30	Tension Scale (100 g full scale)
7-732-050-40	Tension Scale (200 g full scale)
8-960-020-61	Alignment Tape, RR5-1SB-PAL
9-911-053-00	Thickness Gauge
Standard products	Head Demagnetizer, HE-4

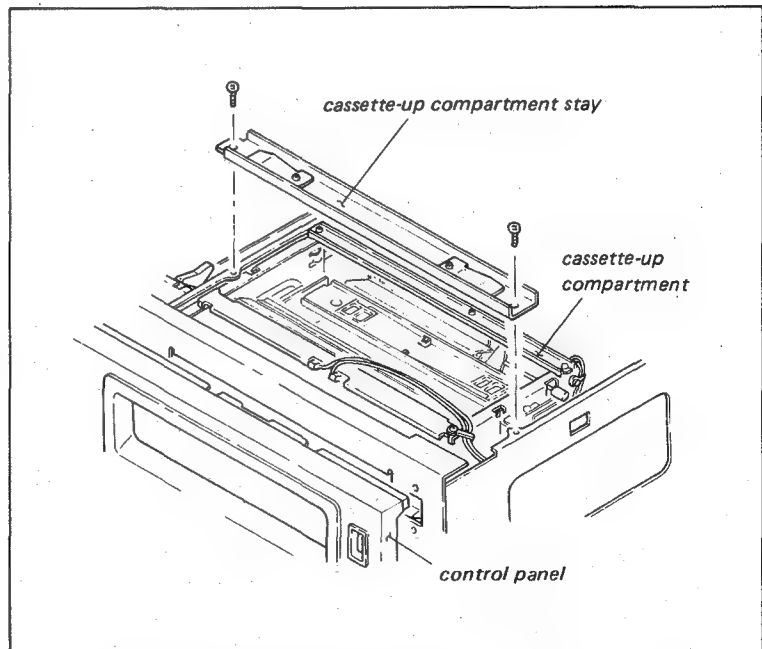
#### 4-5. PERIODIC CHECK AND MAINTENANCE PROCEDURE

When the periodic check or maintenance is attempted, a few items are necessary to remove the cassette-up compartment and to mute the tape beginning sensor and the tape end sensor.

And it is necessary to check the tracking adjustment after the upper drum replacement is attempted.

If necessary, perform the following procedures.

1. Removal of Cassette-up Compartment
  - (1) Remove the upper panel, each side ornamental panels, and the control panel.
  - (2) Remove the cassette-up compartment stay.
  - (3) And bring up the cassette-up compartment from the machine.





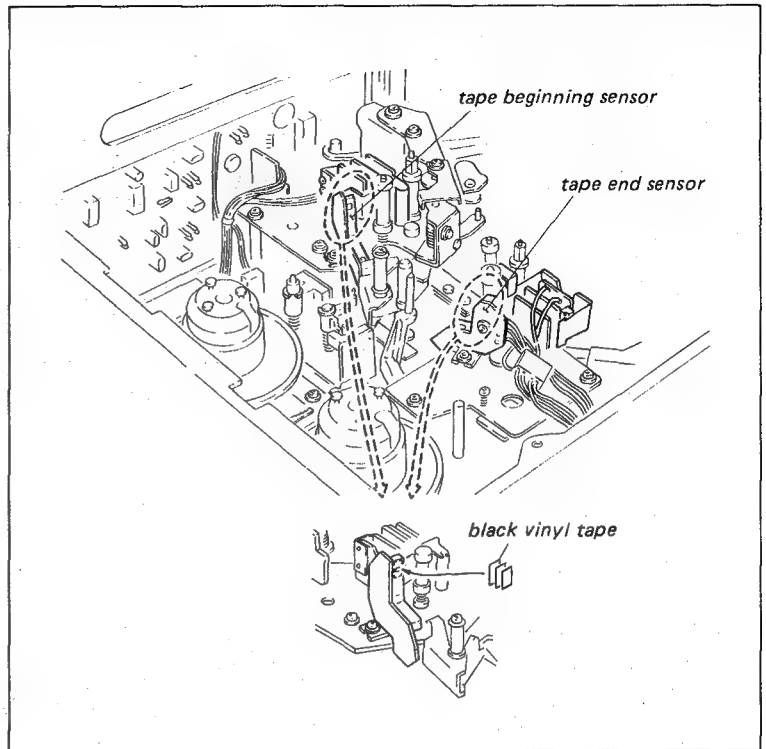
2. Muting of Tape Beginning Sensor and Tape End Sensor

- (1) Cut a piece of black vinyl tape into a piece of 1 cm x 1.5 cm long and place it over to each photo-transistors. Light will path through one or two pieces of tape so that three pieces of black vinyl tape should be over lapped.

**(CAUTION)**

Never forget to remove the black vinyl tape from the two photo-transistors.

If the machine is placed into the F. FWD or REW mode without removing the black vinyl tape, the machine cannot detect the tape beginning or tape end. So the machine cannot operate the AUTO STOP operation. The tape and the machine are put into the dangerous situation.

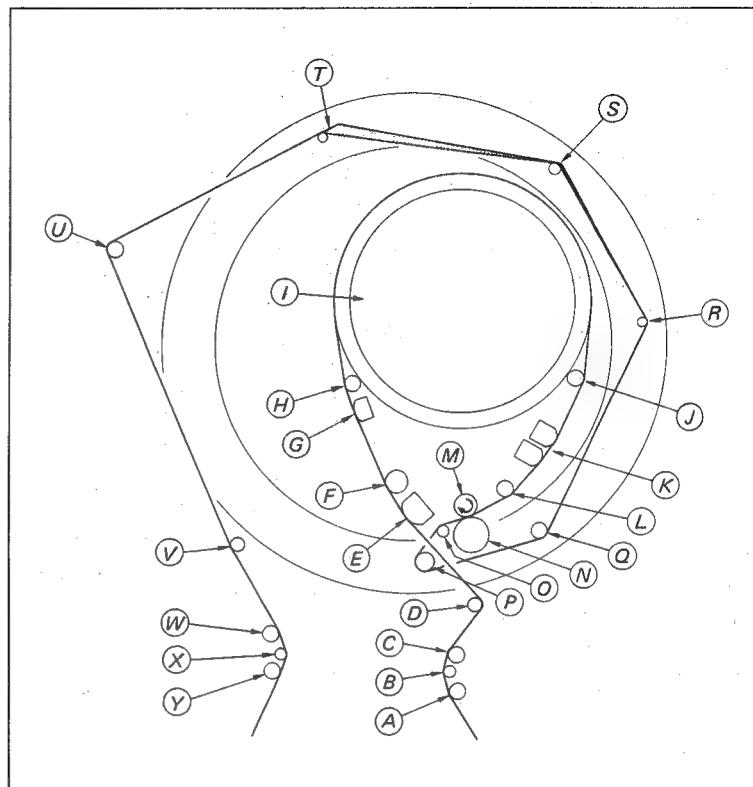




### 3. Tracking Check

Location of the tape guides and heads are follows.

- (A) : supply tape guide 1
- (B) : supply side tension detecting guide
- (C) : supply tape guide 2
- (D) : supply tension regulator arm pin
- (E) : full erase head
- (F) : TG-1
- (G) : time code head
- (H) : TG-2
- (I) : head drum
- (J) : TG-3
- (K) : audio/CTL head
- (L) : TG-4
- (M) : capstan shaft
- (N) : pinch roller
- (O) : correction guide
- (P) : threading guide (1)
- (Q) : threading guide (2)
- (R) : threading guide (3)
- (S) : threading guide (4)
- (T) : correction guide (A)
- (U) : 5th guide
- (V) : 6th guide
- (W) : take-up tape guide 2
- (X) : take-up side tension detecting guide
- (Y) : take-up tape guide 1



The tracking adjustment is required to be performed in the following steps.

- 9-3. Video tracking adjustment
- 9-5-2. Time code head height adjustment
- 9-5-3. Time code head zenith adjustment
- 9-6-1. Audio head height adjustment
- 9-6-2. Audio head zenith adjustment
- 9-6-3. Audio head azimuth adjustment
- 9-6-4. Audio head phase adjustment
- 9-7. Audio/CTL head position adjustment
- 9-8. Video head dihedral adjustment
- 11-11. Switching position adjustment (R/P HEAD)
- 11-20. DT switching position adjustment (1)
- 11-21. DT switching position adjustment (2)
- 11-12. Drum lock phase adjustment
- 13-1-1. ~ 13-1-2. Playback amplifier adjustment
- 13-1-5. Y-RF output balance/level adjustment
- 13-1-6. Chroma-RF balance/level adjustment (R/P HEAD)
- Chroma-RF balance/level adjustment (DT HEAD)
- 13-5-2. Y record current adjustment
- 13-5-3. Chroma record current adjustment
- 14-1. Rotary erase current adjustment
- 11-19-14. DT self-record/playback adjustment



#### 4-5-1. Cleaning Procedure of the Video Heads and the Rotary Erase Heads

**NOTE:** The Dynamic Tracking Heads are mounted on the upper drum through a bimorph (ceramic). If the bimorph is given a strong force, it is possible that the bimorph will be distorted. It is recommended not to clean the DT heads except only when the DT heads are clogged.

With the power OFF. Press the cleaning piece moistured with the cleaning fluid and turn the drum slowly with hand, cleaning the video heads and the rotary erase heads. (Do not exert too much pressure.)

**NOTE:** Never move the cleaning piece in the vertical direction of the head tip in the cleaning. It may to damage the head tips.

#### 4-5-2. Cleaning Procedure of Tape Movement Areas

Wipe the tape bearing surface (of the tape guides, drum, stationary heads, capstan shaft, and the pinch roller) with a piece of cleaning piece moistened with the cleaning fluid.

Cleaning fluid: SONY Part No. Y-2031-001-0

Cleaning piece: SONY Part No. 2-034-697-00

**NOTE:** Don't clean the surface condensation sensor on the lower drum with the cleaning cloth moistened with the cleaning fluid. Clean the surface with dry cloth.

#### 4-5-3. Head Degaussing

It is recommended to demagnetize the rotary heads and the stationary heads with demagnetizer when using as a playback machine.

Demagnetizer: SONY HE-4.

- Bring the tip of the demagnetizer as close as possible to the head tip without actually contacting it. Draw demagnetizer very slowly and turn off demagnetizer when it is at least three feet away from the machine.

#### 4-5-4. Cleaning of Slip-Rings and Brushes

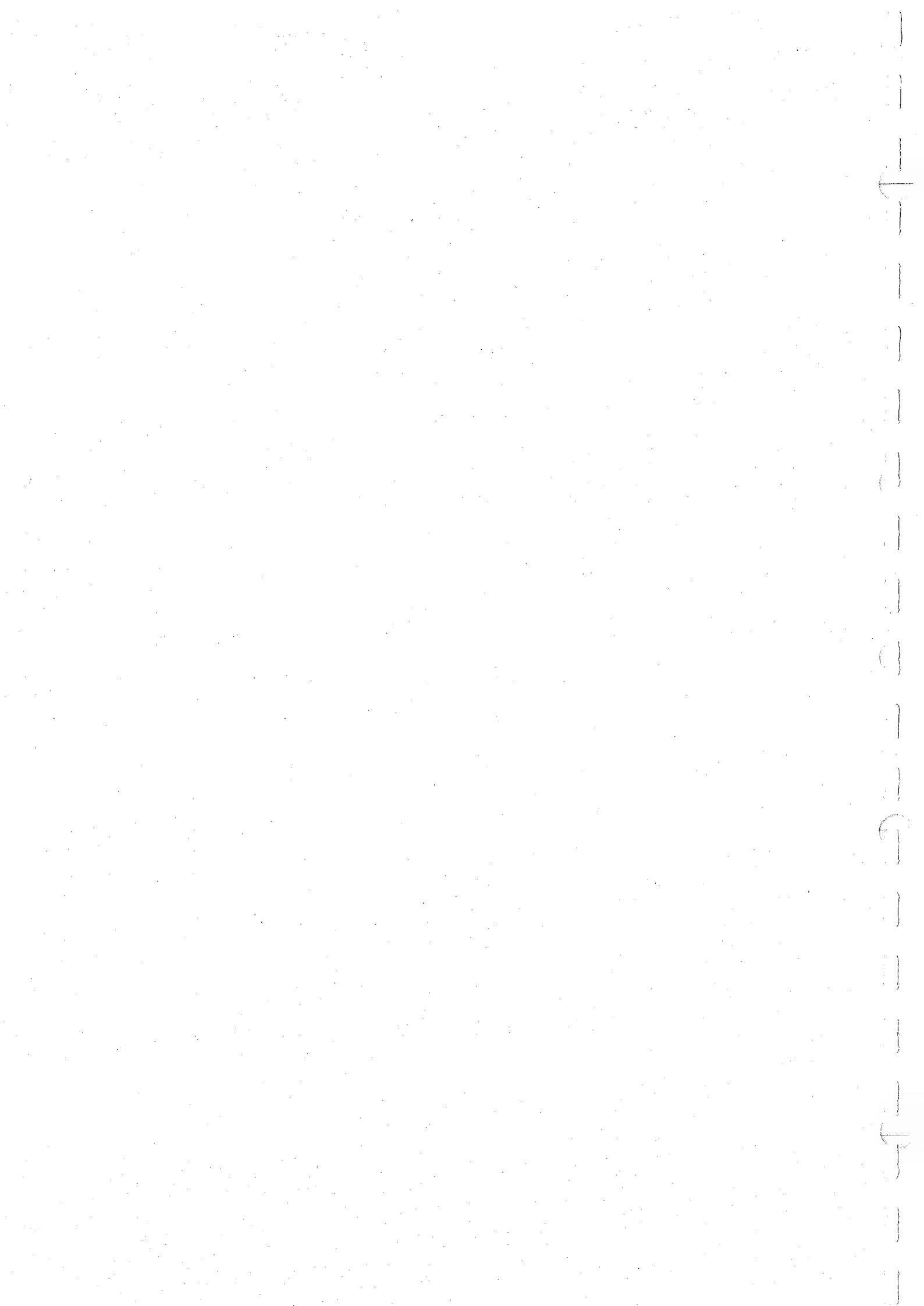
The head drum assembly slip-rings and the brushes do not required periodical cleaning. However if a dust adheres on the slip rings or the brushes, clean the slip-rings or the brushes as follows.

1. Clean the slip-ring or the brush by using soft brush which has short hairs. If this brush can not obtained, use a blower brush and cotton swab.
2. Cleaning fluid is not necessary. However if it is difficult to remove persistent debris, use Freon as cleaning agent.

**NOTE:**

1. Do not use the alcohol as a cleaning fluid. If the slip-rings and the brushes are cleaned with alcohol, the surface tend to attract material which may increase the resistance at the contact area.
2. Do not use conductive grease.



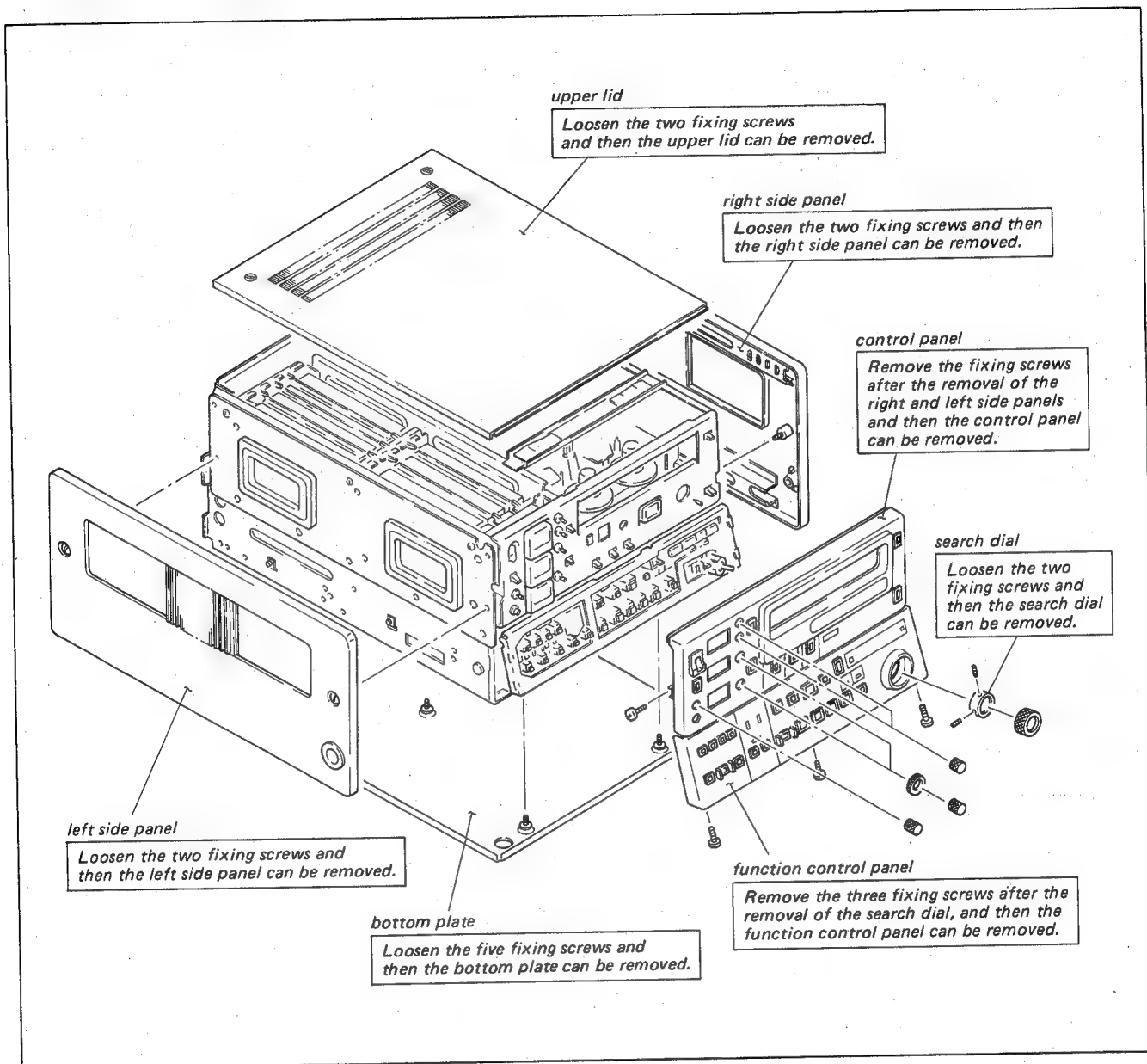




## SECTION 5

### SERVICE INFORMATION

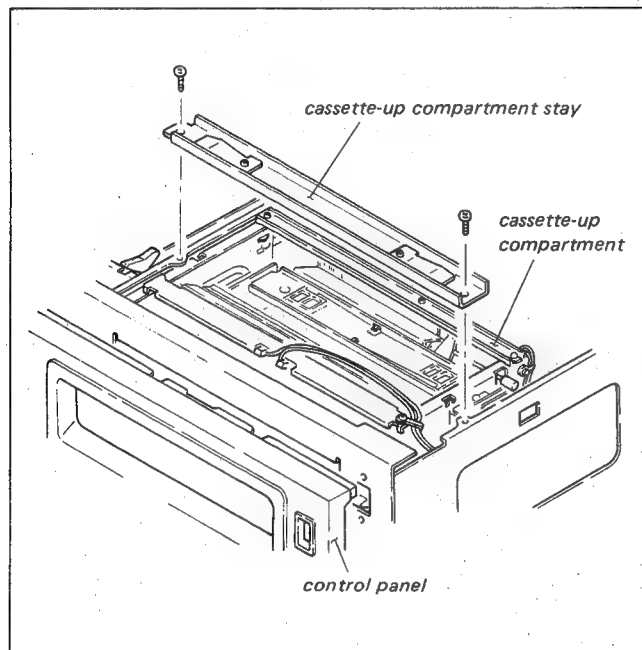
#### 5-1. REMOVAL OF CABINET






## 5-2. REMOVAL OF CASSETTE-UP COMPARTMENT

1. Remove the upper panel, each side ornamental panels, and the control panel.
2. Remove the cassette-up compartment stay.
3. And bring up the cassette-up compartment from the machine.



## 5-3. SPARE PARTS

1. **Safety Related Components Warning.**  
Components identified by shading marked with  on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose part numbers appear in this manual or in service bulletins and service manual supplements published by Sony.
2. Replacement Parts supplied from Sony Parts Center will sometimes have a different shape from the original parts. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts". This manual's exploded views and electrical spare parts list indicate the parts numbers of "the standardized genuine parts at present".  
Regarding engineering parts changes in our engineering department, refer to Sony service bulletins and service manual supplements.
3. Printed Components in Bold-Face type on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

## 5-4. MODULE EXTENDER

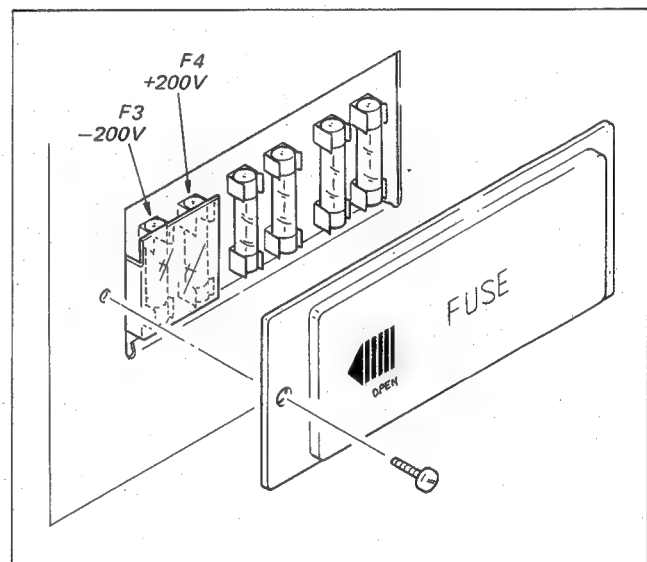
The Amp chassis printed circuit boards can be serviced using a module extender. Simply insert the extender into the Amp chassis and connect the circuit board to be serviced to the end of the extension board.

### (CAUTION)

Be sure to turn off power before inserting or removing extenders or printed circuit boards.

## 5-5. CAUTION OF HIGH VOLTAGE

Do not touch fuse post at any time.





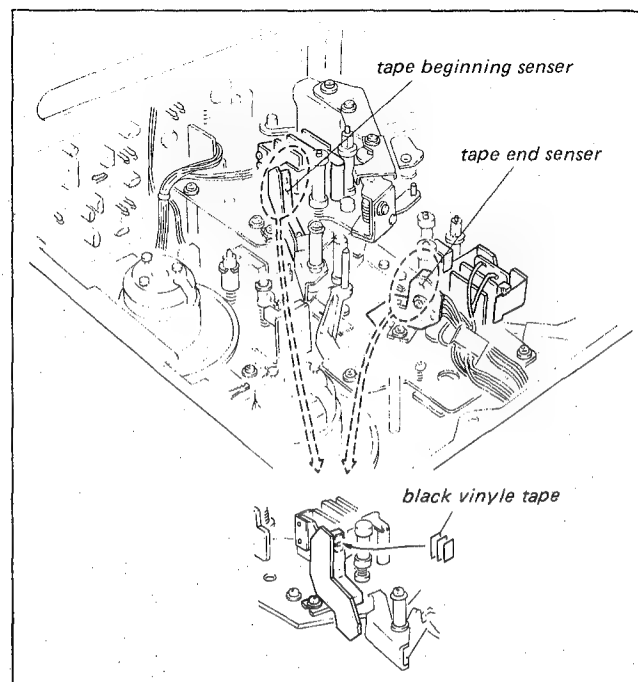
## 5-6. MUTING OF TAPE BEGINNING SENSOR AND TAPE END SENSOR

Cut a piece of black vinyl tape into a piece of 1 cm x 1.5 cm long and place it over to each photo-transistors. Light will path through one or two pieces of tape so that three pieces of black vinyl tape should be over lapped.

### (CAUTION)

Never forget to remove the black vinyl tape from the two photo-transistors.

If the machine is placed into the F. FWD or REW mode without removing the black vinyl tape, the machine cannot detect the tape beginning or tape end. So the machine cannot operate the AUTO STOP operation. The tape and the machine are put into the dangerous situation.



## 5-7. FIXTURE

Parts Number	Description	For Use
J-6001-820-A	Drum Eccentricity Gauge (3)	Upper drum eccentricity adjustment
J-6001-830-A	Drum Eccentricity Gauge (2)	
J-6001-840-A	Drum Eccentricity Gauge (1)	
J-6001-930-A	Drum Eccentricity Gauge (4)	
J-6080-013-A	Dihedral Adjusting Screw	Video head dihedral adjustment
J-6009-830-A	Flatness Plate	Stationary head and tape guide slantness adjustment
J-6130-010-A	Reel Table Height Check Base Jig	Reel table height adjustment
J-6130-020-A	Reel Table Height Check Jig	
J-6150-020-A	Pinch Lever Adjustment Jig	Pinch lever right angle adjustment
J-6150-960-A	Reel Motor Shaft Slantness Check Jig	Reel motor shaft slantness adjustment
Y-2031-001-0 2-034-697-00	Cleaning Fluid Cleaning Piece	Cleaning
3-702-215-01	Torque Measurement Tape (100 mm dia.)	Measurement of torque
3-702-216-01	Back Tension Adjustment Jig	Back tension adjustment
7-723-902-01	Inspection Mirror (handle)	For clearance check
7-723-902-11	Inspection Mirror (mirror)	
7-732-050-30	Tension Scale (100g full scale)	Measurement of back tension and torque
7-732-050-40	Tension Scale (200g full scale)	
7-662-001-62	Sony Grease, SGL-501	For lubrication
8-960-020-62	Alignment Tape RR5-2SB-PAL	Tracking, audio, video and overall adjustment
9-911-053-00	Thickness Gauge	For clearance check
Standard Products	Head Demagnetizer (HE-4)	Degaussing of heads



## 5-8. SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set.

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

### LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

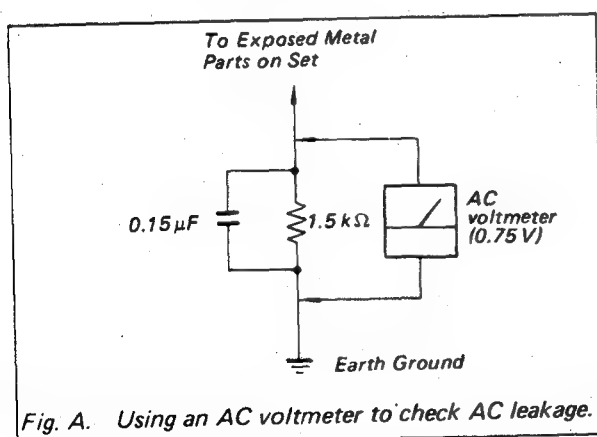


Fig. A. Using an AC voltmeter to check AC leakage.



## SECTION 6

### REPLACEMENT OF MAJOR PARTS

#### 6-1. REPLACEMENT OF DRUM ASSEMBLY

##### Replacement procedure:

- (1) Remove the brush assembly for the slip ring.
- (2) Disconnect the connector of the drum assembly. Remove the three fixing screws and remove the defective drum.
- (3) Install a drum on the base while turning the drum assembly in a counterclockwise direction as seen from top of the set.
- (4) Re-connect the connector.
- (5) Install the brush assembly for the slip-ring.

#### 6-2. REPLACEMENT OF UPPER DRUM ASSEMBLY

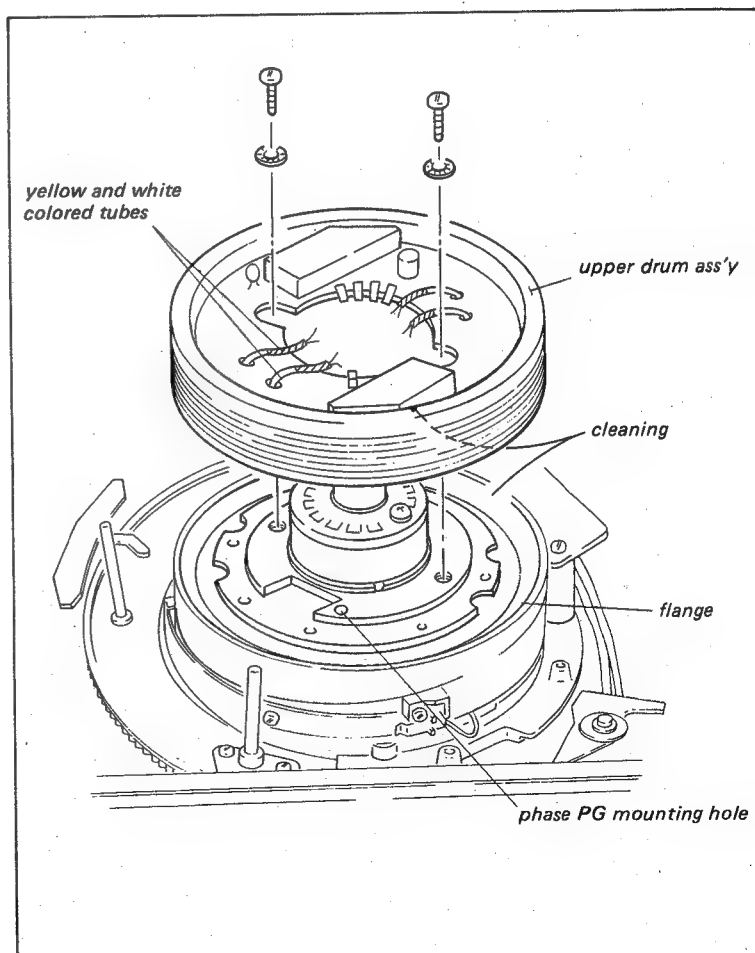
.The rotary video and erase heads cannot be replaced individually; the whole upper drum assembly must be replaced when any one of these heads fails.

.The DA-6 board is mounted on the upper drum assembly, and the dynamic balance adjustment of the whole upper drum assembly is performed in the factory. Therefore the DA-6 board and upper drum assemblies cannot be replaced individually.

.The upper drum assembly has Dynamic Tracking Heads (DT Head). The Dynamic Tracking Head is mounted on the upper drum assembly through a bimorph (ceramic). If the bimorph is given a strong force, it is possible that the bimorph will be distorted. Therefore do not touch the DT heads.

##### Tool:

- Drum eccentricity gauge (1)
- Drum eccentricity gauge (2)
- Drum eccentricity gauge (3)
- Drum eccentricity gauge (4)
- Cleaning fluid
- Cleaning piece



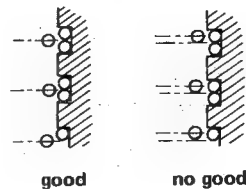
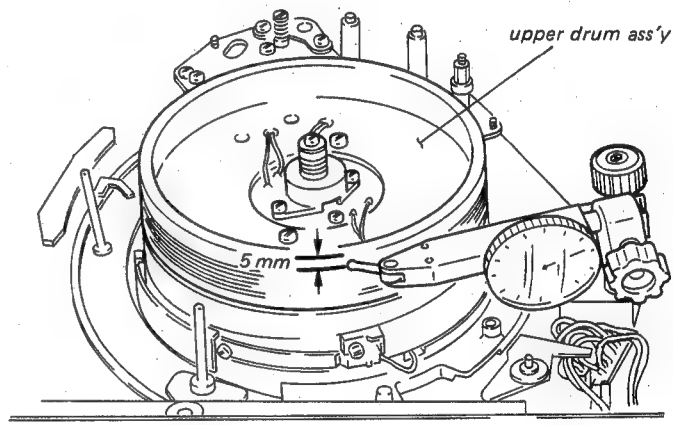
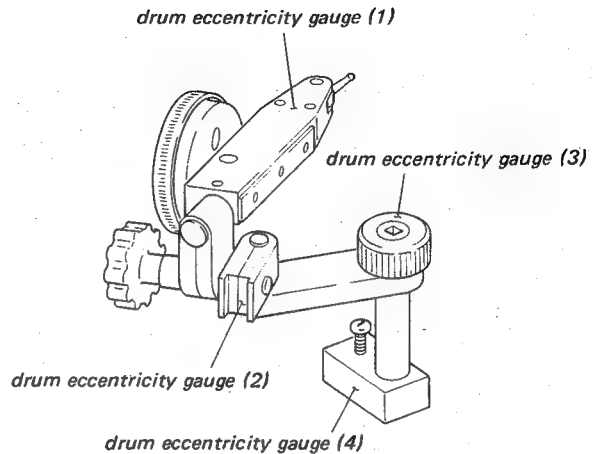


**Replacement procedure:**

- (1) Remove the brush assembly for slip ring.
- (2) Unsolder the eight leads of the video heads and rotary erase heads and the ten terminals from the rounded type printed circuit board, and remove the upper drum assembly from the head drum assembly.
- (3) Clean the matching surface of the flange and new upper drum assembly with a cloth moistened with cleaning fluid. (If there is a spacer between drum and flange, it should be remain in place, or be re-installed in the same place with the new upper drum assembly.)
- (4) Place the upper drum assembly so that the head of the yellow and white colored tubes are close to the phase PG mounting hold on the surface of the flange.

**Adjustment procedure:**

- (1) Assemble the drum eccentricity gauges (1), (2), (3) and (4) as shown in figure. Mount the assembled jigs on the machine so that the tip probe positions at the point about 5mm apart from the top edge of the upper drum.
- (2) Turn the upper drum slowly clockwise and confirm the pointer deflection of the gauge is within 5 micron during one complete turn of the upper drum. If this specification is satisfied, proceed with step (4). If it is not, perform step (3).
- (3) Tap the inside of the upper drum with a nylon hammer or a screwdriver handle and like so that the gauge deflection remains within 5 micron.
- (4) After the adjustment, tighten the two screws that are securing the upper drum, alternately and gradually using a tightening torque: 14 to 16kg x cm.





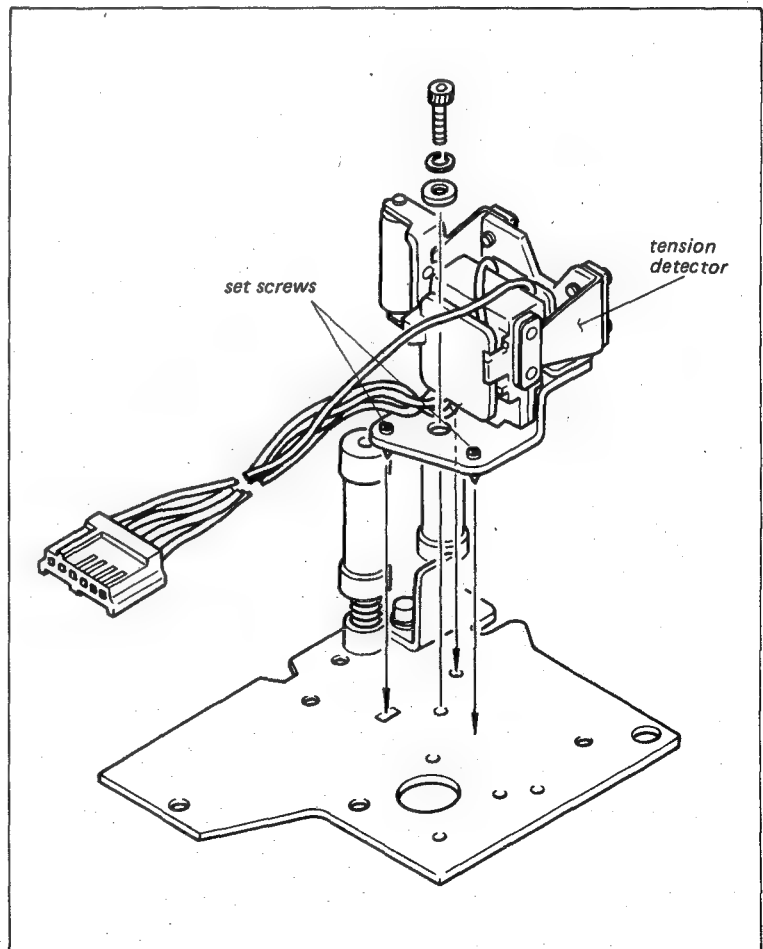
- (5) After the screws are tightened, check again that the eccentricity of the upper drum is within 5 micron.
- (6) Solder the eight leads from the video and rotary erase heads and ten terminals on the upper drum assembly to the rounded type printed circuit board.
- (7) Install the brush assembly for the slip ring. (The positional relationship of the slip-ring and the brush must be as shown in the figure.)

### 6-3. REPLACEMENT OF TENSION DETECTOR

T and S tension detectors are precisely factory calibrated before shipment. Therefore the component parts cannot be replaced as the single parts ;the whole tension detector must be replaced.

#### Replacement procedure:

- (1) Remove the cap screw and remove the tension detector.
- (2) Install the two set screws to the new tension detector.
- (3) Install the tension detector to the set.



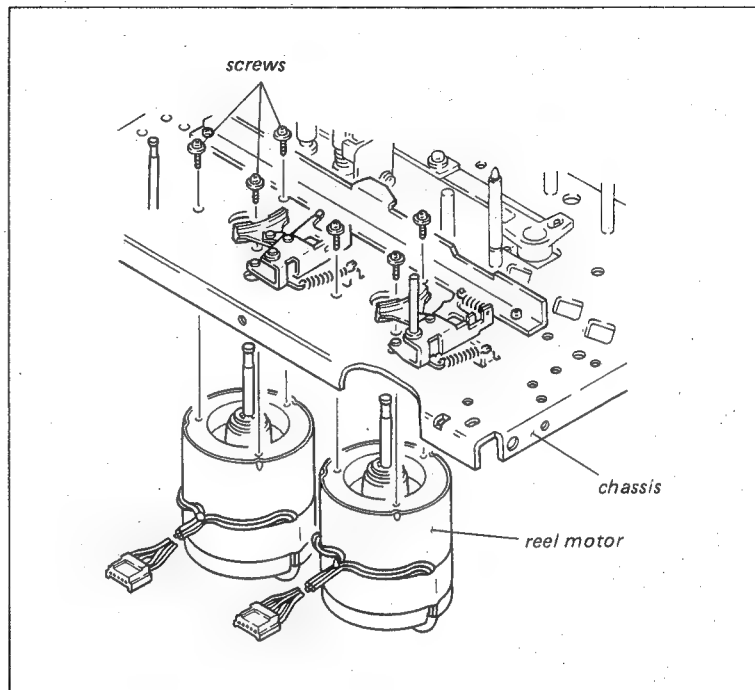


## 6-4. REPLACEMENT OF MOTOR

### 6-4-1. Replacement of Reel Motor

#### Replacement procedure:

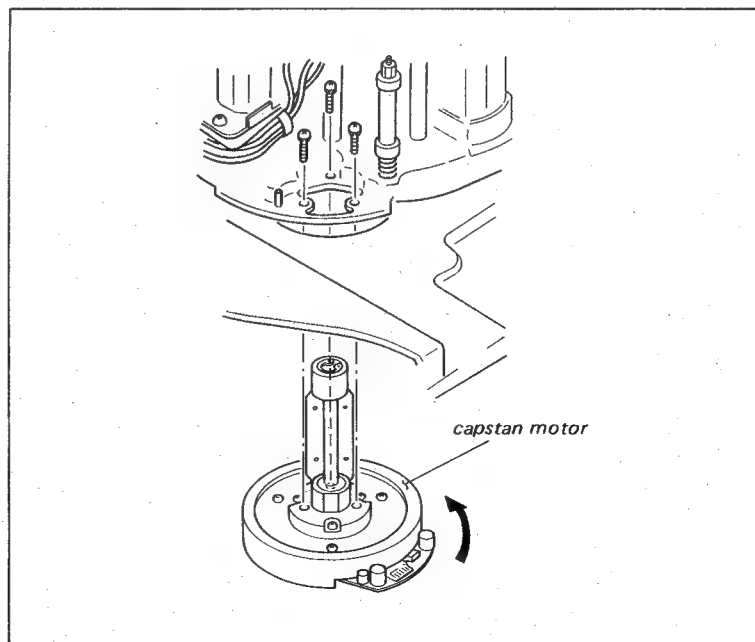
- (1) Loosen the two set screws on the under side of the reel table. Remove the reel table from reel shaft.
- (2) Remove the three screws and replace the reel motor.



### 6-4-2. Replacement of Capstan Motor

#### Replacement procedure:

- (1) Remove the three screws and remove the capstan motor.
- (2) Install the new capstan motor.
- (3) While turning the capstan motor in the counterclockwise direction and tighten the fixing screw.



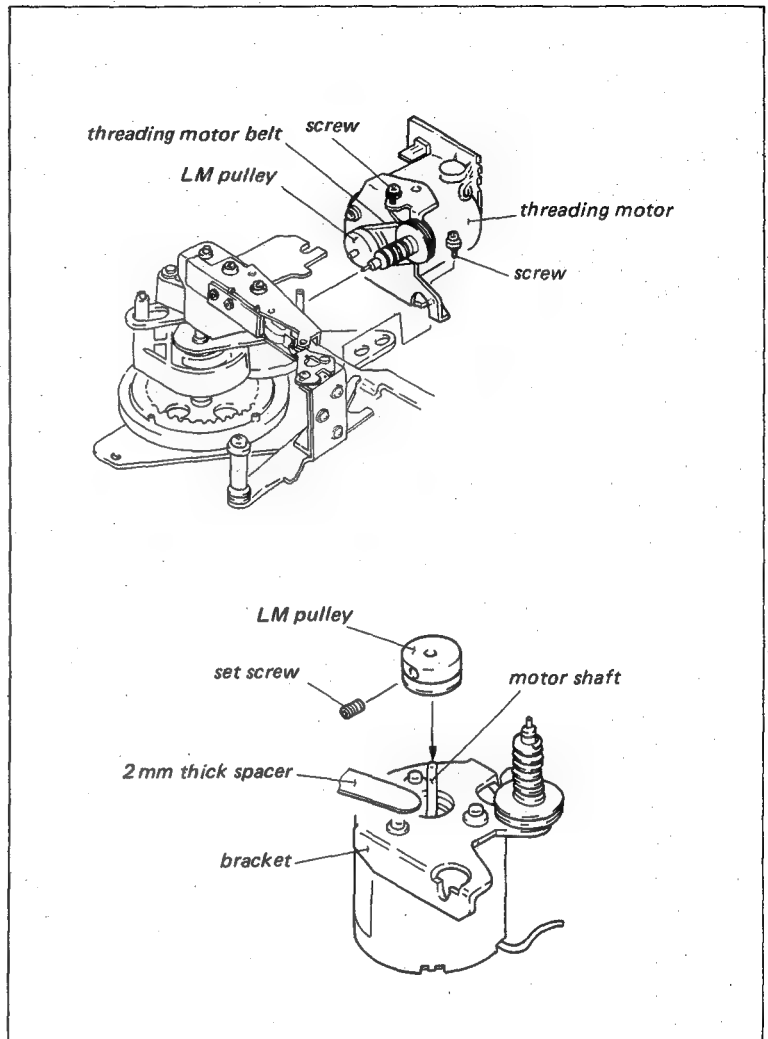


#### 6-4-3. Replacement of Threading Motor

**Tool:** Allen wrench (each edge has 1.27mm)  
Thickness gauge

**Replacement procedure:**

- (1) Remove the threading motor block from chassis.
- (2) Replace the motor.
- (3) Install the LM pulley so that the clearance between the pulley and the bracket is 2mm.

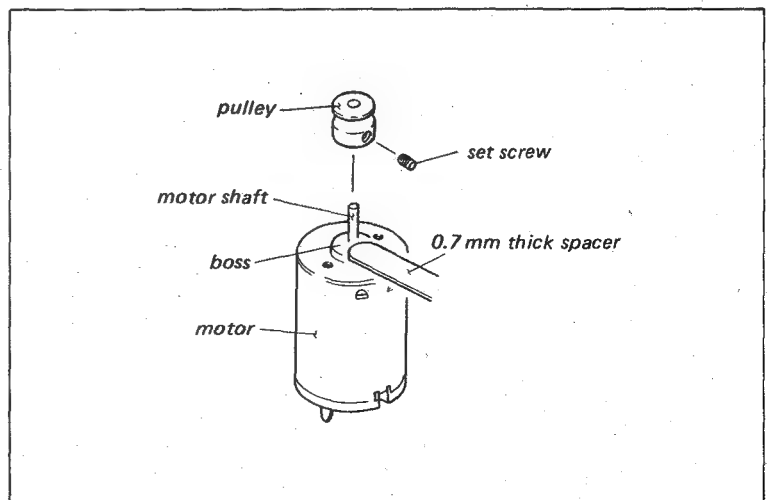


#### 6-4-4. Replacement of Cassette-up Assembly's motor

**Tool:** Allen wrench (each edge has 1.5mm)  
Thickness gauge

**Replacement procedure:**

- (1) Replace the cassette-up assembly's motor.
- (2) Install the pulley so that it is positioned 0.7mm apart from the edge of the motor boss.



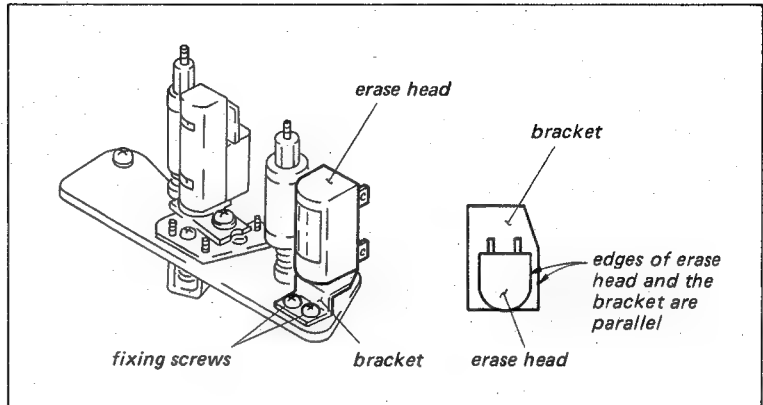


## 6-5. REPLACEMENT OF THE STATIONARY HEAD

### 6-5-1. Replacement of Erase Head

#### Replacement procedure:

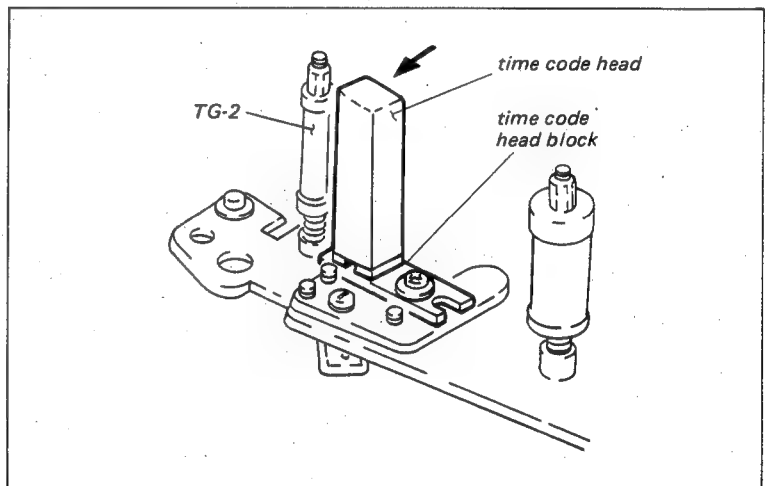
- (1) Remove the erase head block. Remove the two screws and replace the erase head.
- (2) Install the erase head so that the positional relationship between the erase head and bracket is as shown in figure.



### 6-5-2. Replacement of Time Code Head

#### Replacement procedure:

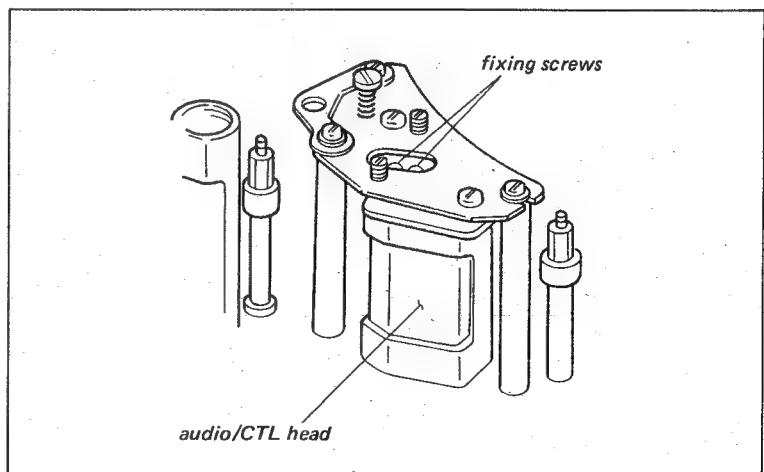
- (1) Remove the time code head block. Remove the two screws and replace the time code head block.
- (2) Install the time code head while pressing it in the direction of the arrow.



### 6-5-3. Replacement of Audio/CTL Head

#### Replacement procedure:

- (1) Remove the audio/CTL head block from the machine.
- (2) Install the audio/CTL head turning in the clockwise direction.



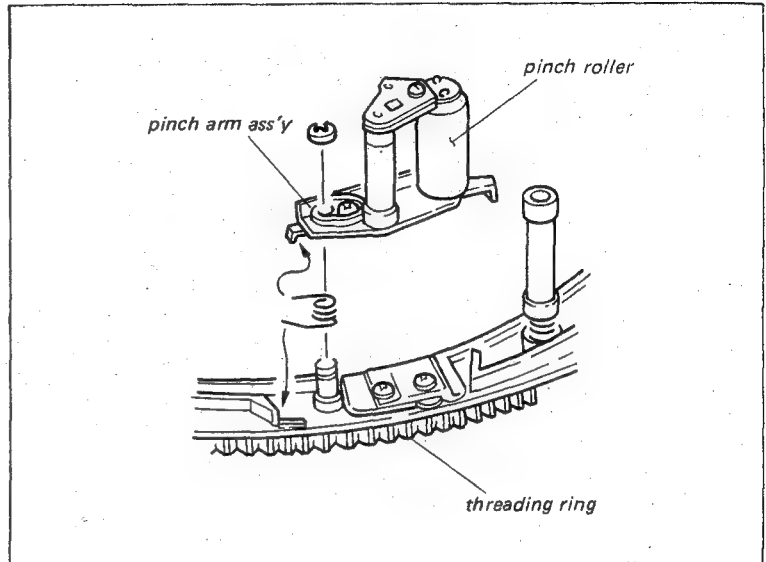


#### 6-6. REPLACEMENT OF PINCH ROLLER

The pinch roller cannot be replaced individually. The whole pinch arm assembly must be replaced.

##### Replacement procedure:

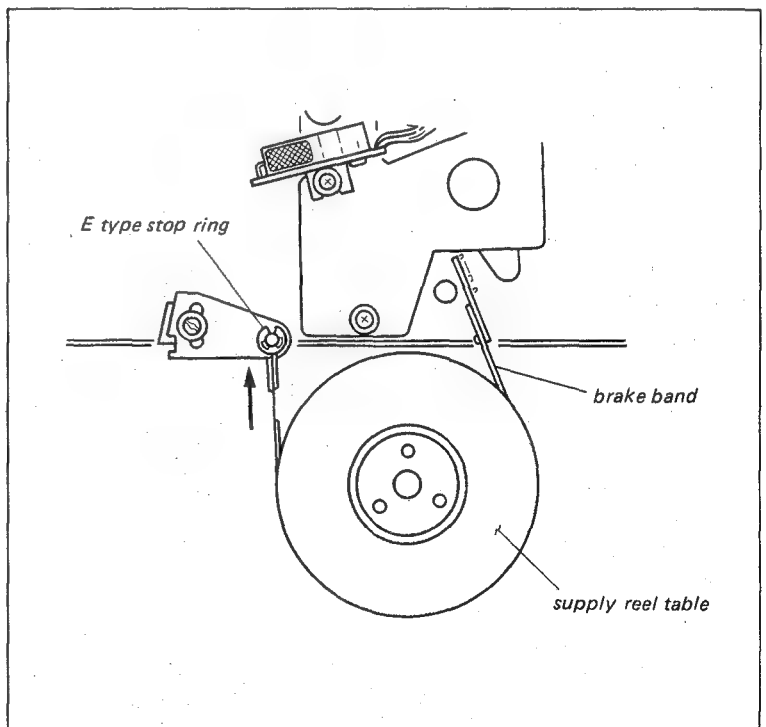
- (1) Remove the pinch arm ass'y from the threading ring.
- (2) Install the new pinch arm ass'y on the threading ring as shown in figure.



#### 6-7. REPLACEMENT OF BRAKE BAND

##### Replacement procedure:

- (1) Put the machine into STOP mode.
- (2) Turn off the power.
- (3) Remove the brake band protector.
- (4) Remove the E type stop ring. And move the brake band in the direction shown by arrow for removal.
- (5) Replace the new one.



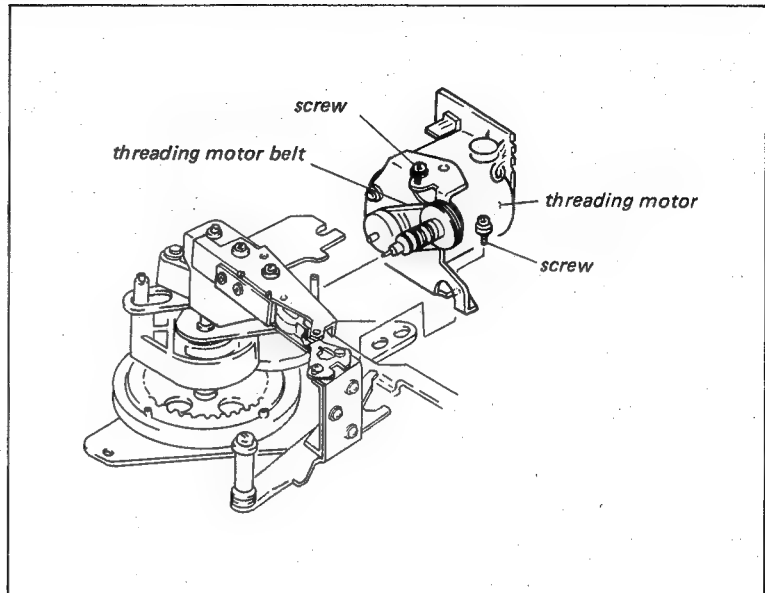


## 6-8. REPLACEMENT OF THE BELT

### 6-8-1. Replacement of the Threading Motor's belt

#### Replacement procedure:

- (1) Put the machine into the EJECT completion mode.
- (2) Turn off the power and remove the MD and YD board.
- (3) Disconnect the connector of the threading motor block.
- (4) Remove the worm gear cover.
- (5) Loosen the two fixing screws of the motor block and remove the motor block toward the amp chassis.
- (6) Replace the belt with a new one.
- (7) Assemble the motor block by reversing steps (6) to (1).
- (8) Turn on the power and insert a cassette tape. Check the threading and unthreading operations are smooth.





## 6-9. BRUSH REPLACEMENT

Spare parts of the brush is prepared as the following two types.

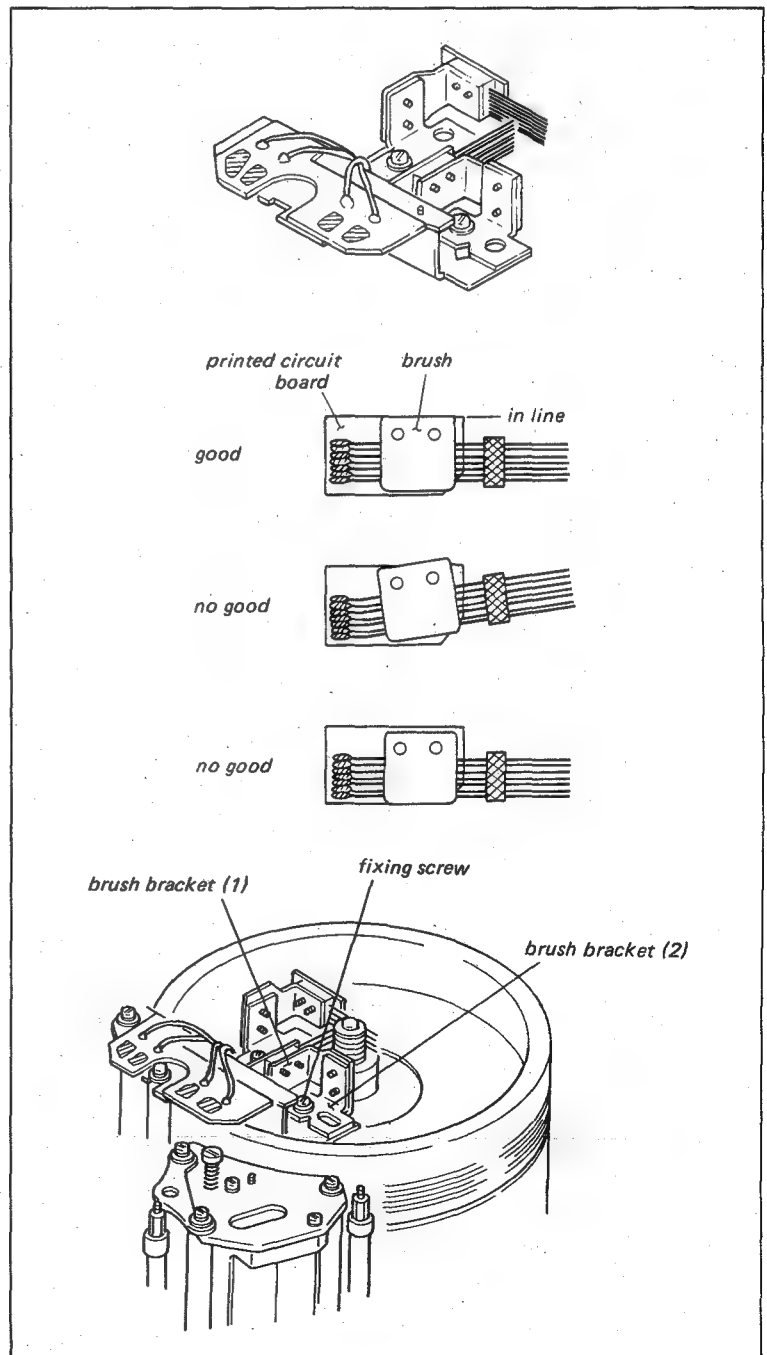
1. Brush assembly as shown in figure.
2. Single part of the brush.

Replacement procedure of the single part is described here.

It is necessary to perform the brush height adjustment and brush position adjustment in any type of spare parts.

### Replacement procedure:

- (1) Remove the brush and solder the new brush to the printed circuit board so that the edge of the brush and the printed circuit board are in the same plane.
- (2) Install the assembled brush into the brush bracket.





## 6-10. ADJUSTMENT ITEM TABLE AFTER MAIN PARTS REPLACEMENT

### Replacement of Drum Assembly

Slip-ring and Brush Position Adjustment (9-10) → FWD Back tension Adjustment (8-4) → Pinch Roller Azimuth Adjustment (9-1-5) → Tape Run Adjustment at Threading Guide (1) (9-2-1) → Tape Wrinkle Release Adjustment at Pinch Roller (9-2-2) → Video Tracking Adjustment (9-3) → FF/REV Tape Run Overall Adjustment (9-2-6) → Time Code Head Height Adjustment (9-5-2) → Time Code Head Zenith Adjustment (9-5-3) → Audio Head Adjustment (9-6) → Video Head Dihedral Adjustment (9-8) → Video Head Azimuth Adjustment (9-9) → AUDIO/CTL Head Position Adjustment (9-7) → Drum Free Speed Adjustment (11-2) → Drum Lock Phase Adjustment (11-12) → Switching Position Adjustment (11-11) → Picture Splitting Compensator Adjustment (11-13) → Dynamic Tracking Control System Adjustment (11-19) → DT Switching Position Adjustment (1) (11-20) → DT Switching Position Adjustment (2) (11-21) → DT x 2, x 3 Mode Switching Position Adjustment (11-22) → FH Phase Adjustment (11-23) → Playback Amplifier Adjustment (13-1) → Record Current Frequency Response Adjustment (13-5-1) → Y Record Current Adjustment (13-5-2) → Chroma Record Current Adjustment (13-5-3) → Overall Frequency Response Adjustment (13-7) → Rotary Erase Current Adjustment (14-1) → Config Mode Switching Pulse Adjustment (14-2)

### Replacement of Upper Drum Assembly

Upper Drum Eccentricity Adjustment (6-2) → Slip-ring and Brush Position Adjustment (9-10) → Video Tracking Adjustment (9-3) → FF/REV Tape Run Overall Adjustment (9-2-6) → Time Code Head Height Adjustment (9-5-2) → Time Code Head Zenith Adjustment (9-5-3) → Audio Head Adjustment (9-6) → Video Head Dihedral Adjustment (9-8) → Video Head Azimuth Adjustment (9-9) → AUDIO/CTL Head Position Adjustment (9-7) → Drum Free Speed Adjustment (11-2) → Drum Lock Phase Adjustment (11-12) → Switching Position Adjustment (11-11) → Picture Splitting Compensator Adjustment (11-13) → DT Self Record/Playback Adjustment (11-19-14) → DT Switching Position Adjustment (1) (11-20) → DT Switching Position Adjustment (2) (11-21) → DT x 2, x 3 Mode Switching Position Adjustment (11-22) → FH Phase Adjustment (11-23) → Playback Amplifier Adjustment (13-1) → Record Current Frequency Response Adjustment (13-5-1) → Y Record Current Adjustment (13-5-2) → Chroma Record Current Adjustment (13-5-3) → Overall Frequency Response Adjustment (13-7) → Rotary Erase Current Adjustment (14-1)

### Replacement of AUDIO/CTL Head

Audio Head Zenith Adjustment (9-6-2) → Audio Head Azimuth Adjustment (9-6-3) → Audio Head Height Adjustment (9-6-1) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → Audio Head Height Adjustment (9-6-1) → Audio Head Azimuth Adjustment (9-6-3) → Audio Head Phase Adjustment (9-6-4) → AUDIO/CTL Head Position Adjustment (9-7) → Playback Frequency Response/Level Adjustment (12-6) → Playback Output Level Adjustment (12-7) → Record Level Adjustment (12-17) → Record Current Frequency Response Adjustment (1) (12-18) → Record Current Frequency Response Adjustment (2) (12-19) → Audio Erase Current Adjustment (1) (12-9) → Audio Erase Current Adjustment (2) (12-10) → Audio Erase Current Adjustment (3) (12-11) → Record Bias Current Adjustment (1) (12-12) → Record Bias Current Adjustment (2) (12-16)



## Replacement of Time Code Head

Time Code Head Zenith Adjustment (9-5-3) → Time Code Head Tape-to-Head Contact Adjustment (9-5-1) → Time Code Head Height Adjustment (9-5-2) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → AUDIO/CTL Head Position Adjustment (9-7) → Time Code Playback/Output Level Adjustment (14-4) → Time Code Record Current Adjustment (14-5)

## Replacement of Erase Head

Erase Head Zenith Adjustment (9-4) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → AUDIO/ CTL Head Position Adjustment (9-7)

## Replacement of Capstan Motor

Capstan Free Speed Adjustment (11-3) → Pinch Roller Adjustment (9-1) → Tape Run Adjustment at Threading Guide (1) (9-2-1) → Tape Wrinkle Release Adjustment at Pinch Roller (9-2-2) → FWD/REV Tape Run Overall Adjustment (9-2-6) → Video Tracking Adjustment (9-3) → AUDIO/CTL Head Position Adjustment (9-7)

## Replacement of Pinch Roller

Pinch Roller Self-Alignment Adjustment (9-1-3) → Pinch Roller Zenith Adjustment (9-1-4) → Pinch Roller Azimuth Adjustment (9-1-5) → Pinch Roller Preset Adjustment (9-1-6) → Tape Run Adjustment at Threading Guide (1) (9-2-1) → Tape Wrinkle Release Adjustment at Pinch Roller (9-2-2) → Video Tracking Adjustment (check) (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → AUDIO/CTL Head Position Adjustment (check) (9-7)

## Replacement of Threading Ring

Threading Ring Rotation Adjustment (7-10-1) → Ring Drive Gear Engagement Adjustment (7-10-2) → Ring Sensor Position Adjustment (7-10-3) → Threading Slider Assembly End Position Adjustment (7-10-5) → Threading Slider EJECT Position Adjustment (7-10-6) → Release Cam Installing Position Adjustment (7-10-7) → Pinch Roller Stopper Position Adjustment (9-1-2) → Pinch Roller Self-Alignment Adjustment (9-1-3) → Pinch Roller Zenith Adjustment (9-1-4) → Pinch Roller Azimuth Adjustment (9-1-5) → Pinch Roller Preset Adjustment (9-1-6) → Tape Run Adjustment at Threading Guide (1) (9-2-1) → Tape Wrinkle Release Adjustment at Pinch Roller (9-2-2) → Tape Run Adjustment at Correction Guide (A) (9-2-3) → Tape Run Adjustment at 6th Guide (9-2-4) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → AUDIO/CTL Head Position Adjustment (9-7)

## Replacement of Take-up Reel Table

Reel Table Height Adjustment (7-2) → EM-1 Board Mounting Position Adjustment (7-3) → Brake Torque Adjustment (8-3) → FWD/REV Tape Run Overall Adjustment (9-2-6)



#### Replacement of Supply Reel Table

Reel Table Height Adjustment (7-2) → EM-1 Board Mounting Position Adjustment (7-3) → Brake Torque Adjustment (8-3) → Supply tension Regulator Arm FWD Position Adjustment (7-6) → FWD Back Tension Adjustment (8-4) → Video Tracking Adjustment (9-3) → FWD/REV Tape Run Overall Adjustment (9-2-6)

#### Replacement of Brake Band

Supply Tension Regulator Arm FWD Position Adjustment (7-6) → FWD Back Tension Adjustment (8-4) → FWD/REV Tape Run Overall Adjustment (9-2-6) → Video Tracking Adjustment (check) (9-3) → AUDIO/CTL Head Position Adjustment (9-7)

#### Replacement of Take-up Reel Motor

Reel Motor Shaft Slantness Adjustment (7-4) → Reel Table Height Adjustment (7-2) → EM-1 Board Mounting Position Adjustment (7-3) → Take-up Reel Motor Speed Adjustment (11-14) → Take-up Reel Motor Current Sensitive Adjustment (8-7) → Brake Torque Adjustment (8-3) → FWD/REV Tape Run Overall Adjustment (9-2-6) → Video Tracking Adjustment (check) (9-3)

#### Replacement of Supply Reel Motor

Reel Motor Shaft Slantness Adjustment (7-4) → Reel Table Height Adjustment (7-2) → EM-1 Board Mounting Position Adjustment (7-3) → Supply Reel Motor Speed Adjustment (11-15) → Supply Reel Motor Current Sensitive Adjustment (8-8) → Brake Torque Adjustment (8-3) → Supply Tension Regulator Arm FWD Position Adjustment (7-6) → FWD Back Tension Adjustment (8-4) → FWD/REV Tape Run Overall Adjustment (9-2-6) → Video Tracking Adjustment (check) (9-3) → AUDIO/CTL Head Position Adjustment (9-7)

#### Replacement of Tension Detector

Tension Detector Adjustment (8-5)



## SECTION 7

### LINK AND DRIVE SYSTEM ALIGNMENT

#### (PREPARATION)

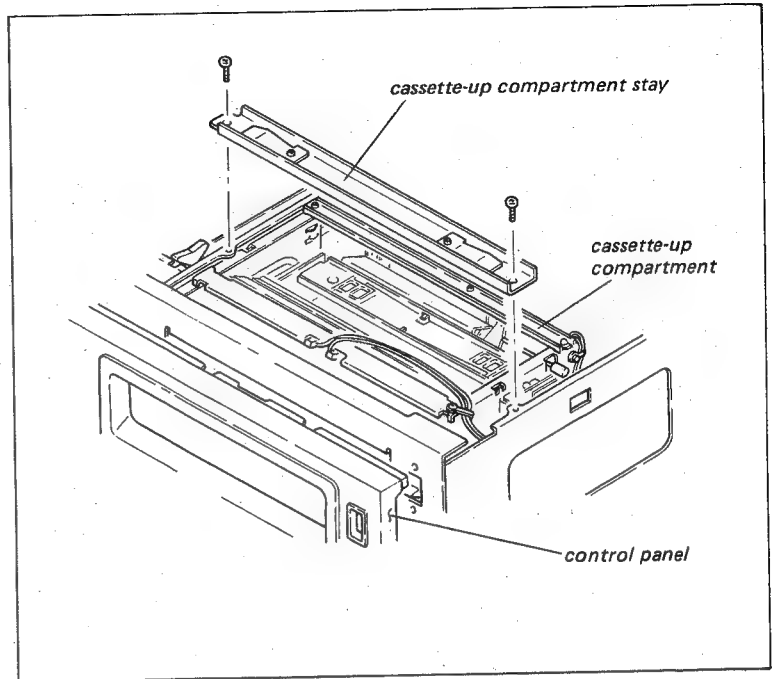
When the adjustment in this section is attempt, there are few items to need operating as follows.

#### (1) Removal of Cassette-up Compartment

Remove the upper panel, each side ornamental panels. Loosen the right and left sides fixing screws of control panel.

Remove the cassette-up compartment stay.

Disconnect the connector of the cassette-up compartment. And bring up the cassette-up compartment from the machine.



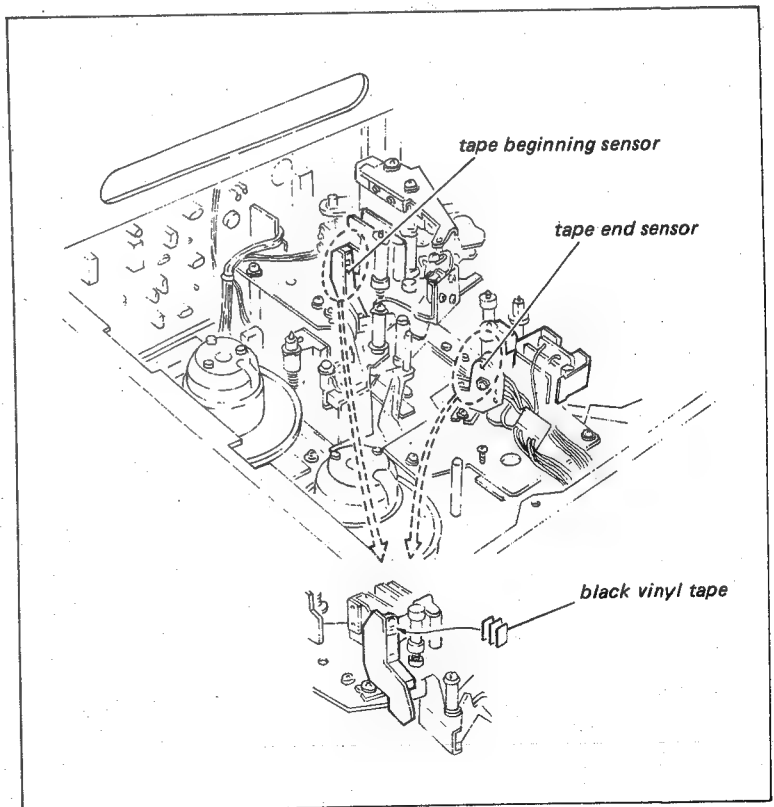
#### (2) Muting of Tape Beginning Sensor and Tape End Sensor

There are two sensors to detect the tape beginning and the tape end and to operate the AUTO STOP near the supply and take-up reel tables. When the machine is operated without inserting the cassette-tape, it is necessary to mute this function.

Cut a piece of black vinyl tape into a piece of 1 cm x 1.5 cm long and place it over to each photo-transistors. Light will path through one or two pieces of tape so that three pieces of black vinyl tape should be over-lapped.

#### (CAUTION)

Never forget to remove the black vinyl tape from the two photo-transistors. If the machine is placed into the F.FWD or REW mode without removing the black vinyl tape, the machine cannot detect the tape beginning or tape end. So the machine cannot operate the AUTO STOP operation. The tape and the machine are put into the dangerous situation.





**(3) Module Extender**

Be sure to turn off power before inserting or removing printed circuit board. Do not touch the connector of printed circuit board.

**(4) Muting of TAPE PROTECTION Signal**

When the machine is put into the PLAY, FF or REW mode without inserting the cassette tape, it is necessary to mute the TAPE PROTECTION signal for the tape protection. These operations are as follows.

.Remove the RS-4 board.

.Insert the extension board into this position and insert the RS-4 board to the end of the extension board.

Short between TP512 and TP514/RS-4 with short clip lead.

**(5) Muting of THREADING MOTOR DISABLE Signal**

It is necessary to stop the THREADING MOTOR DISABLE signal so that the machine is putted into the threading or unthreading mode without inserting the cassette tape.

These operations are as follows.

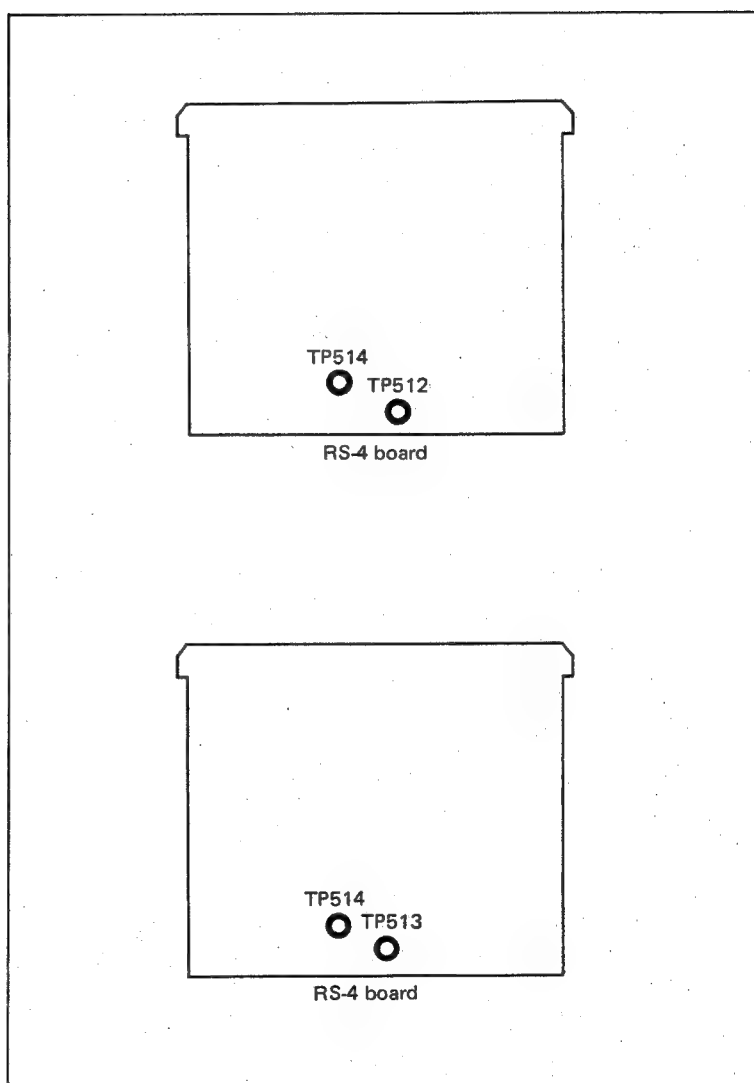
Remove the RS-4 board from the machine

Insert the extension board into this position and insert the RS-4 board to the end of the extension board.

Short between TP513 and TP514/RS-4 with short clip lead.

**(6) Cassette Insertion in Alignment**

The tape does not insert except the particular appointment in this alignment.





**(7) Definition of Mode and Procedure to Put the Machine into the Certain Mode without Cassette Tape.**

•**EJECT Completion Mode.**

The states that the 5th guide, 6th guide and the supply tension regulator arm return to the EJECT position completely. The machine is put into the mode as mentioned above to press the EJECT button.

•**STOP Mode**

The states that the threading ring turns into the clockwise direction as far as it will go and the pinch roller is positioned in front of the capstan shaft.

Turn on the power after mute the functions of tape beginning and end sensors.

One or two seconds later, start the threading operation automatically and put the machine into the STOP mode.

•**PLAY Mode**

Stop the functions of the TAPE PROTECTION signal and THREADING DISABLE signal.

Put the machine into STOP mode as mentioned above and press the PLAY button.

Grasp the supply and take-up reel tables by hand. The machine is putted into the PLAY mode automatically.



## 7-1. CASSETTE RETAINER HEIGHT ADJUSTMENT

### Tool:

Reel table height check base jig  
Thickness gauge

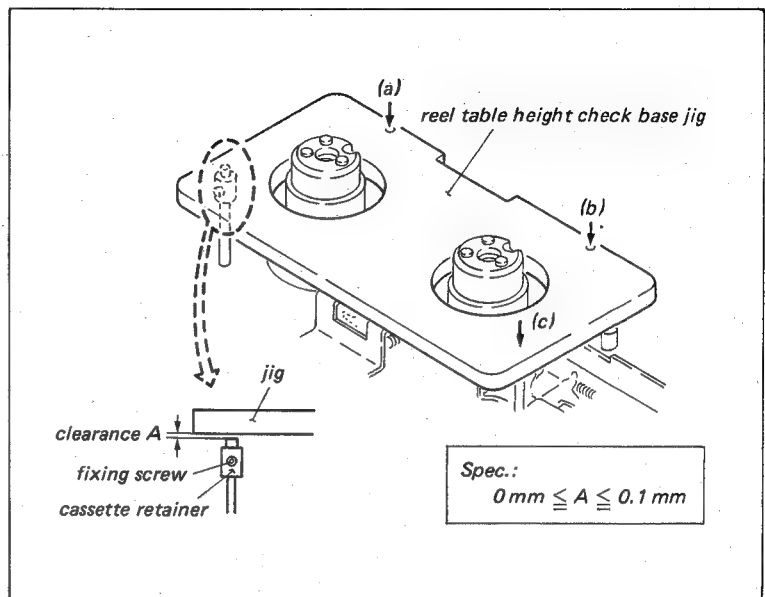
Mode: STOP

### Check procedure:

Check that the clearance between the base jig and the cassette retainer meets the required specification while pushing lightly the reel table height check base jig marked (a), (b) and (c) toward the chassis.

### Adjustment procedure:

Adjust the position of the cassette retainer to meet the required specification.



## 7-2. REEL TABLE HEIGHT ADJUSTMENT

Since the reel table height from the chassis functions as the reference height in the entire tape thread and run system, it is required that the reel table height adjustment should be attempted carefully, and deliberately.

### Tool:

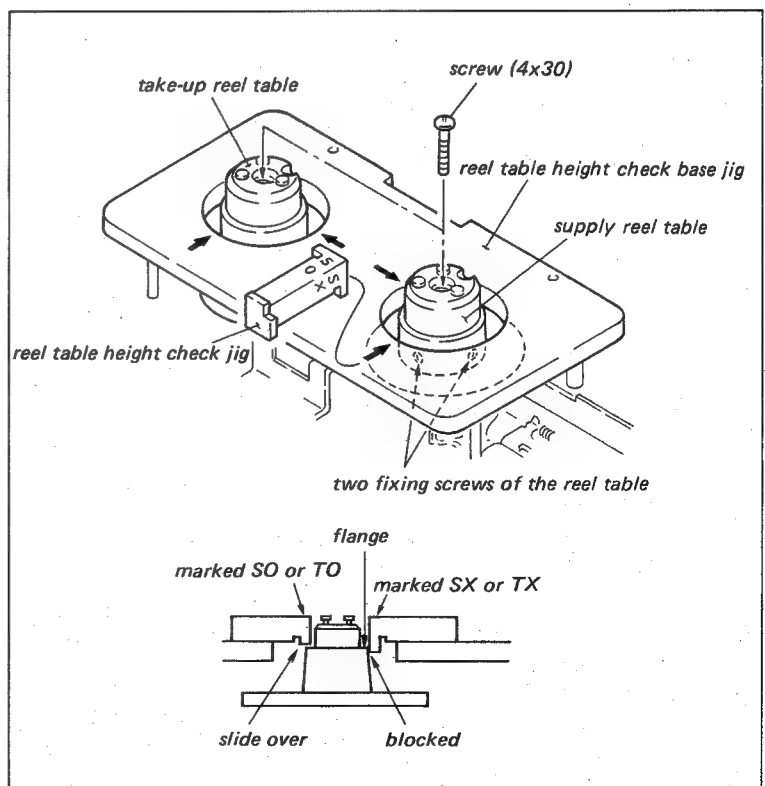
Reel table height check base jig  
Reel table height check jig  
Screw (4 x 30)  
Allen wrench (each edge has 1.5mm)

Mode: Power off mode

### Check procedure:

Check that the probes of the reel table height check jig marked "SO" and "TO" can slide over the reel table leaving a space between the jig and the reel table, while the probes marked "SX" and "TX" are blocked, and cannot slide over reel table.

Use the "SO" and "SX" probes for the supply reel table.  
Use the "TO" and "TX" probes for the take-up reel table.





**Adjustment procedure:**

- (1) Thread the screw (4 x 30) at the center of the reel table as far as it will go.
- (2) Loosen the two fixing screws of the reel table.
- (3) Turn the threaded screw to meet the required specification.  
When heigher the reel table, press it lightly while turning the screw to the counterclockwise direction.
- (4) After adjusting, tighten the screws at the side of reel table and check height again.

**7-3. EM-1 BOARD MOUNTING POSITION ADJUSTMENT**

**Tool:** Thickness gauge

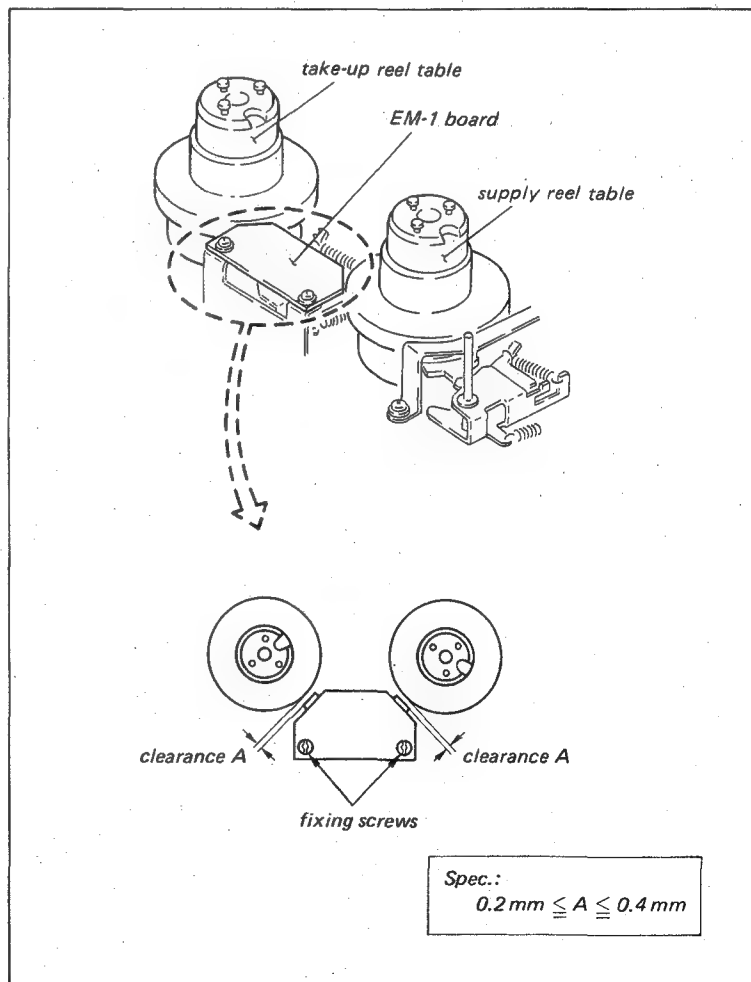
**Mode:** STOP

**Check procedure:**

Check that the clearance meets the required specification.

**Adjustment procedure:**

Adjust the EM-1 board mounting position.





#### 7-4. REEL MOTOR SHAFT SLANTNESS ADJUSTMENT

This adjustment is required only when the reel motor is replaced or removed.

##### Tool:

Reel table height check base jig  
Reel motor shaft slantness check jig

Mode:EJECT completion

##### Preparation:

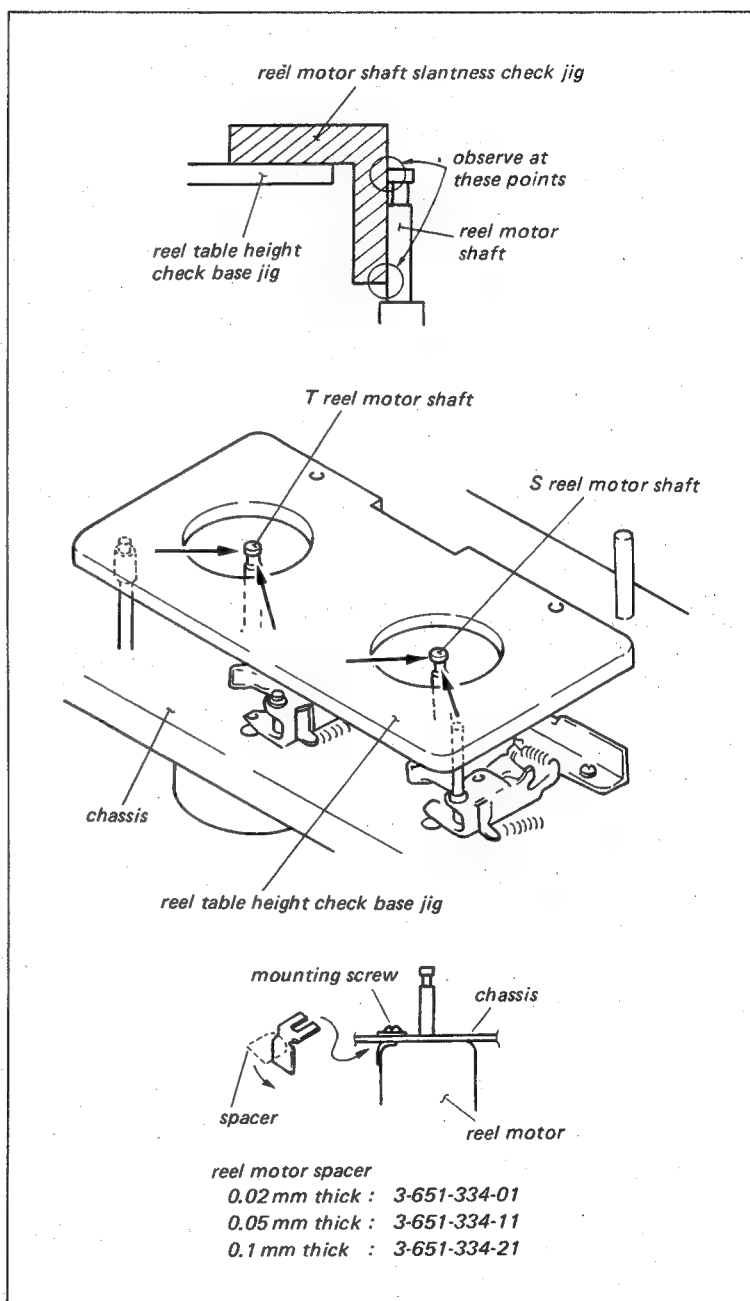
Loosen the two screws at the side of reel table and remove the reel table.

##### Check procedure:

Check that there is little clearance between the jig and the reel motor shaft at the upper or the lower portion as visual, when the reel motor shaft slantness check jig is set on the reel motor shaft from two directions as shown in figure.

##### Adjustment procedure:

Loosen the three fixing screws. Insert the reel motor spacer between the reel motor and the chassis to meet the required specification.





## 7-5. S TENSION REGULATOR ARM FF POSITION ADJUSTMENT

**Tool:** Extension board

**Mode:** STOP

### Preparation:

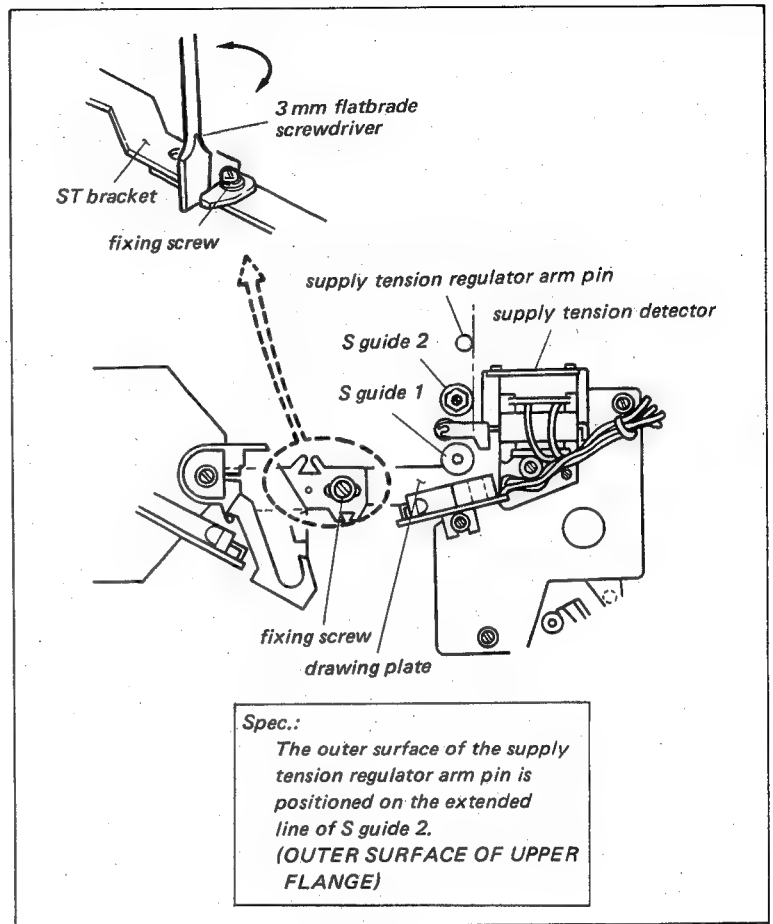
- (1) Mute the tape beginning sensor and the tape end sensor.
- (2) Mute the TAPE PROTECTION signal and the THREADING MOTOR DISABLE signal.
- (3) Turn the power on and put the machine into STOP mode. Turn the power off.

### Check procedure:

Check that the positional relationship between the S tension regulator arm pin and the S guide (2) meets the required specification.

### Adjustment procedure:

- (1) Loosen the fixing screw of the ST bracket about 1/2 turns.
- (2) Insert a flatblade 3mm screwdriver into a notch, and move the ST bracket by turning the screwdriver slowly to meet the required specification.
- (3) Tighten the screw while pressing the ST bracket against the drum.





## 7-6. SUPPLY TENSION REGULATOR ARM FWD POSITION ADJUSTMENT

**Tool:** KCS-20 cassette tape

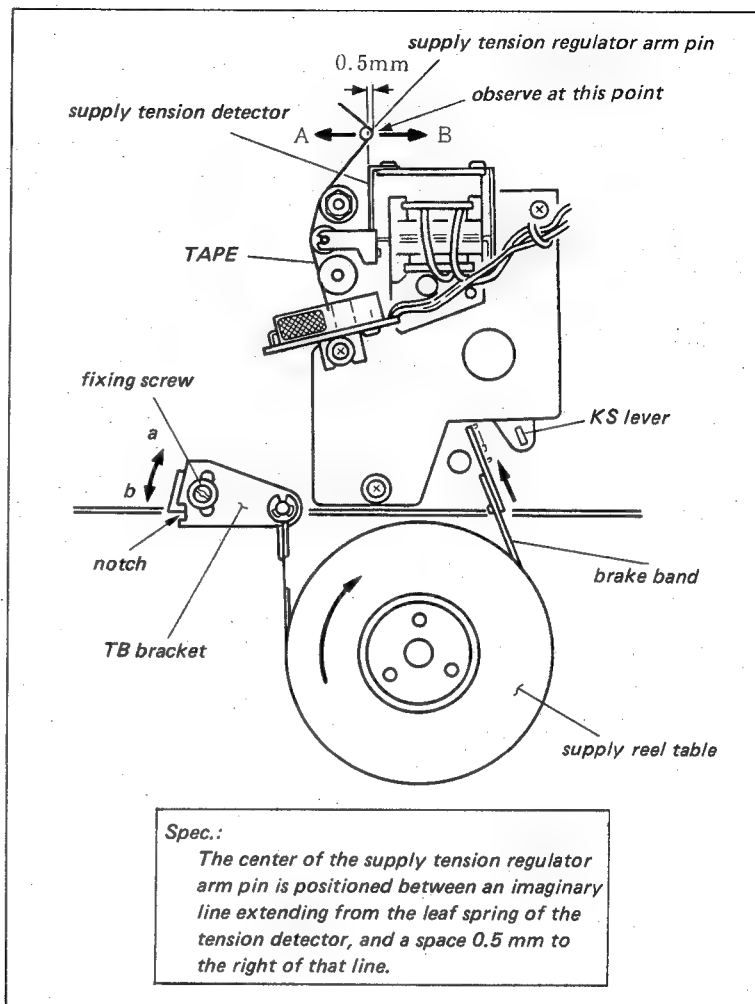
### Check procedure:

While playing back the beginning of KCS-20 cassette tape, check that positional relationship of the supply tension regulator arm pin and the supply tension detector meets the specification.

If not, perform the adjustment procedure.

### Adjustment procedure:

- (1) Remove the KCS-20 cassette tape.
- (2) Loosen the fixing screw about 1/4 turn.
- (3) Insert a flatblade 3mm screwdriver into the notch of the TB bracket, and move the TB bracket in the direction shown by the arrow. Check that the positional relationship is in the same manner as check procedure. If supply thension regulator arm pin is positioned at A side then, turn the TB bracket to "a" direction. And if it is on B side, turn it to "b" direction.
- (4) Perform FWD back tension adjustment.





## 7-7. CASSETTE-UP COMPARTMENT ADJUSTMENT

### 7-7-1. IN Switch Position Adjustment

#### Tool:

KCA-60 cassette tape

Thickness gauge

Circuit tester

#### Preparation:

- (1) Connect the connector CN19 of the harness for cassette-up compartment and the terminal on the CC-9 board with the jumper leads.

connector of harness	terminal on CC-9 board
4 pin (5 V) ←	4 pin/CN1
5 or 2 pin (GND) ←	5 or 2 pin/CN1

- (2) Turn on the power.

#### Check procedure:

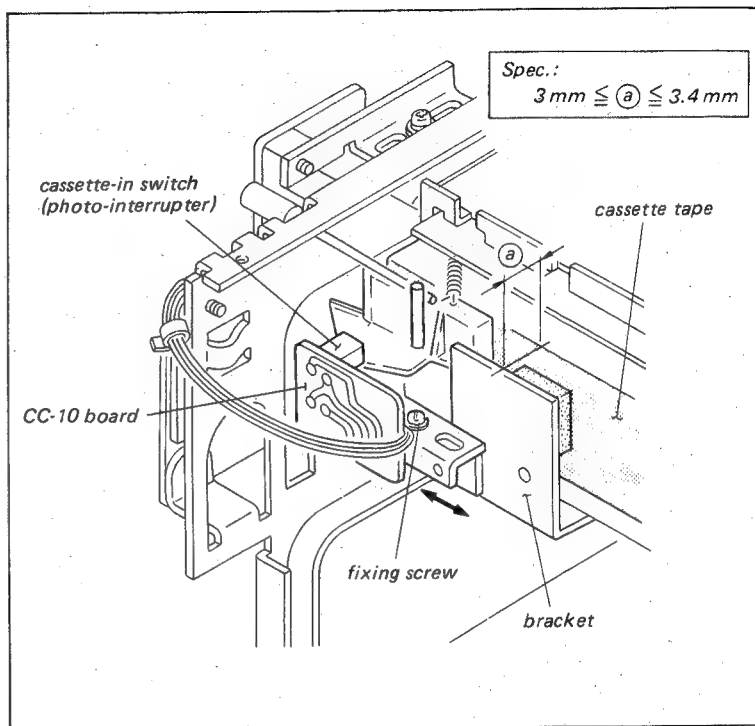
- (1) Connect the circuit tester to 2 terminal on CC-9 board.
- (2) Insert a KCA-60 cassette tape slowly.
- (3) Check that the clearance between the front side of the cassette tape and the bracket of cassette-up compartment meets the required specification when the circuit tester is turned "H" level.(about 5 V)

#### Adjustment procedure:

Adjust the position of the cassette-in switch in the direction of the arrow to meet the required specification.

#### Adjusting procedure;

Insert a 3.3mm thickness gauge between cassette tape and bracket. Adjust the position of the cassette-in switch so that the tester is turned to "H" in this position.





## 7-7-2. DOWN Switch Position Adjustment

Tool: Circuit tester

### Preparation:

- (1) Connect the connector of the harness for cassette-up compartment and the terminal on CC-9 board with the jumper leads.

connector of harness	terminal on CC-9 board
4 pin (5 V) ←	4 pin/CN1
5 or 2 pin (GND) ←	5 or 2 pin/CN1

- (2) Turn on the power.

### Check procedure:

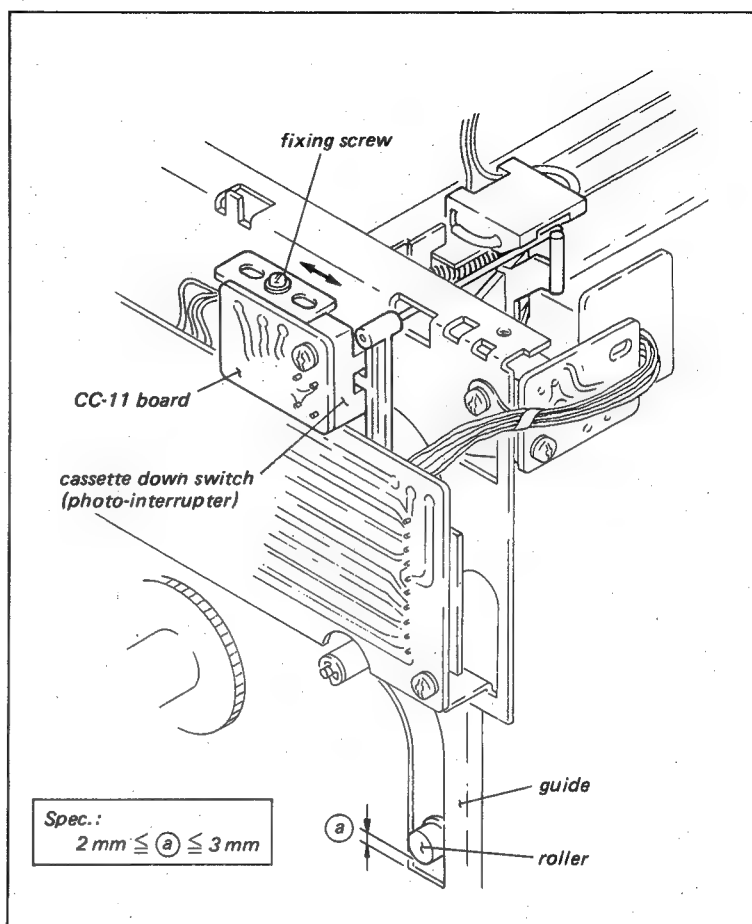
- (1) Connect the circuit tester to 5 terminal on CC-9 board.
- (2) Turn the white colored gear on the right side of the cassette-up compartment in the clockwise direction.
- (3) When the circuit tester is turned to "H", check that the clearance between the roller and the guide meets the required specification.

### Adjustment procedure:

Adjust the position of the cassette-down switch in the direction of the arrow to meet the required specification.

Adjusting procedure;

Turn the gear on the right side so that the clearance between the roller and the guide is 2.2mm clearance. Adjust the position of the cassette-down switch so that the circuit tester is turned to "H" in this position.





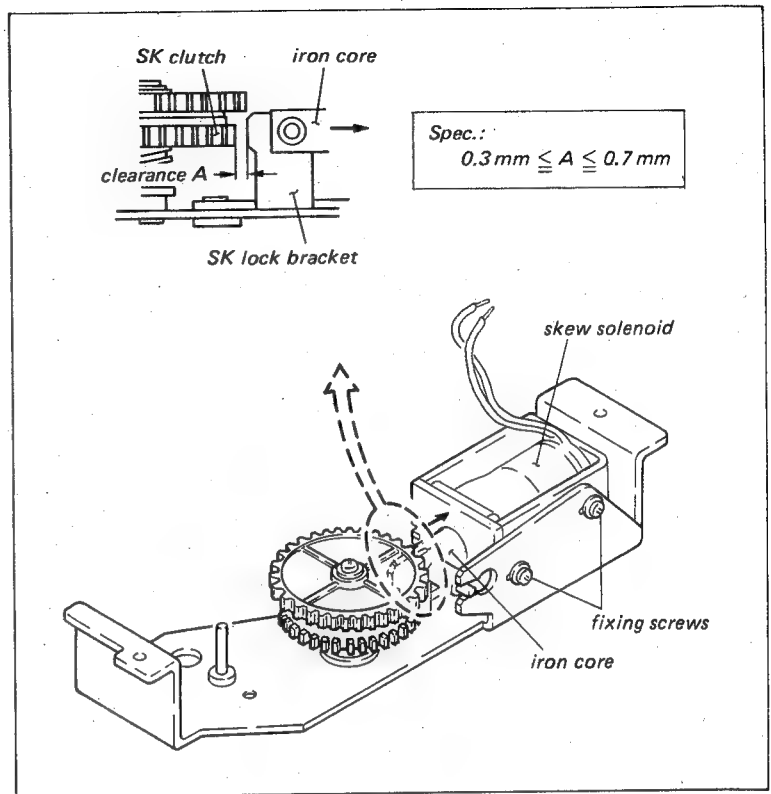
## 7-8. SKEW SOLENOID MOUNTING POSITION ADJUSTMENT

### Check procedure:

- (1) Push the iron core into the fully energized position as far as it will go.
- (2) Check that the clearance between the white colored SK clutch and SK lock bracket meets the required specification as visual.

### Adjustment procedure:

Adjust the mounting position of the skew solenoid to meet the required specification.



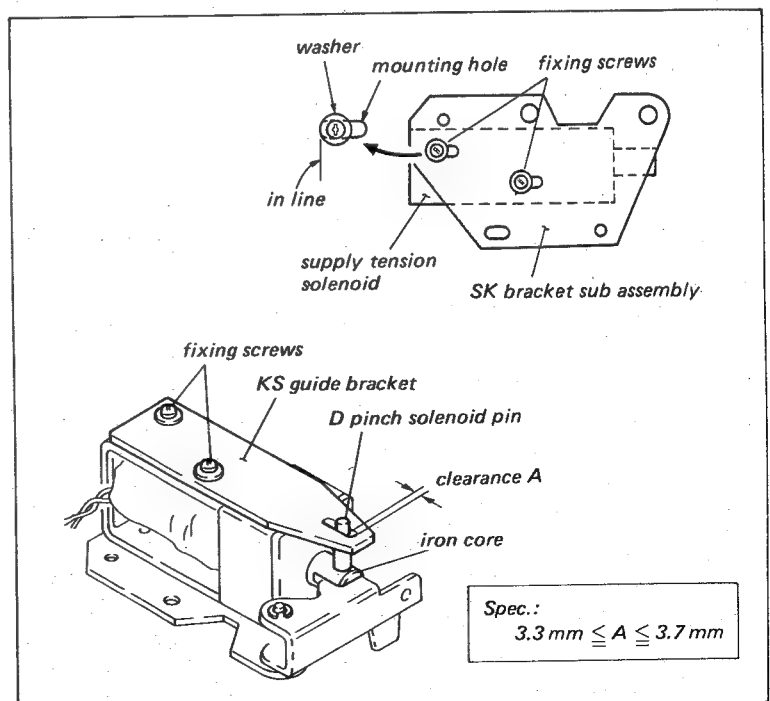
## 7-9. SUPPLY TENSION SOLENOID MOUNTING POSITION ADJUSTMENT

Remove the supply tension solenoid from the machine in this adjustment.

Tool: Thickness gauge

### Adjustment procedure:

- (1) Attach the supply tension solenoid to the KS bracket sub assembly so that meets the relationship between the washer and the bracket as shown in figure.
- (2) Push the iron core into the energized position with finger, and attach the KS guide bracket so that the positional relationship between KS guide bracket and D pinch solenoid pin meets the specification.





## 7-10. THREADING SYSTEM ADJUSTMENT

### 7-10-1. Threading Ring Rotation Adjustment

This adjustment is required only when the threading ring is replaced or removed. It is usually not required.

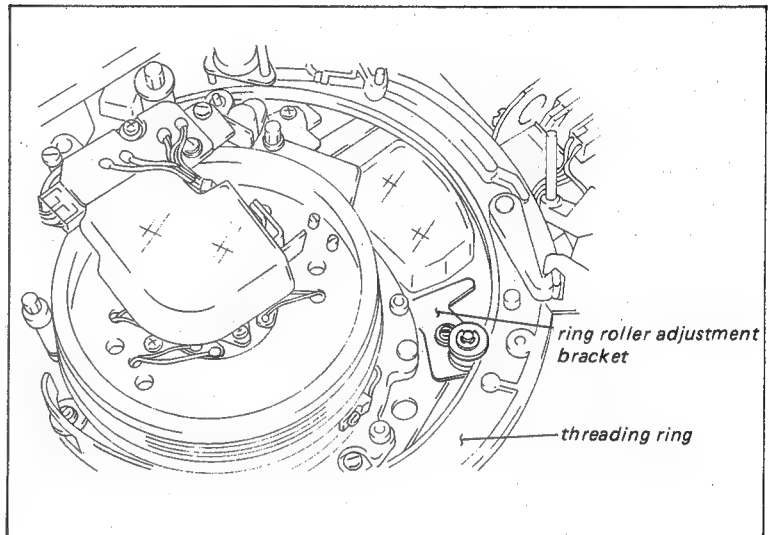
#### Adjustment procedure:

- (1) Loosen the screw of the ring sensor.
- (2) Cancel the engagement of the ring drive gear and the threading ring.
- (3) Remove the protector (R) above the ring roller adjustment bracket.
- (4) Adjust the position of the ring roller adjustment bracket to meet the required specification.

#### Adjusting procedure;

Insert a 0.3mm thick paper between the threading ring and the ring roller. Paper of this maintenance manual is 0.1mm thick so that the three fold becomes 0.3mm thick.

- (5) Check that the rotation of the threading ring is smooth when it rotates to clockwise and counterclockwise directions several times with finger.  
(If rotation becomes heavy in specific position, perform the procedure (4) in that position.)
- (6) After this adjustment, perform the sec.7-10-2 Ring Drive Gear Engagement Adjustment and sec.7-10-3 Ring Sensor Position Adjustment.





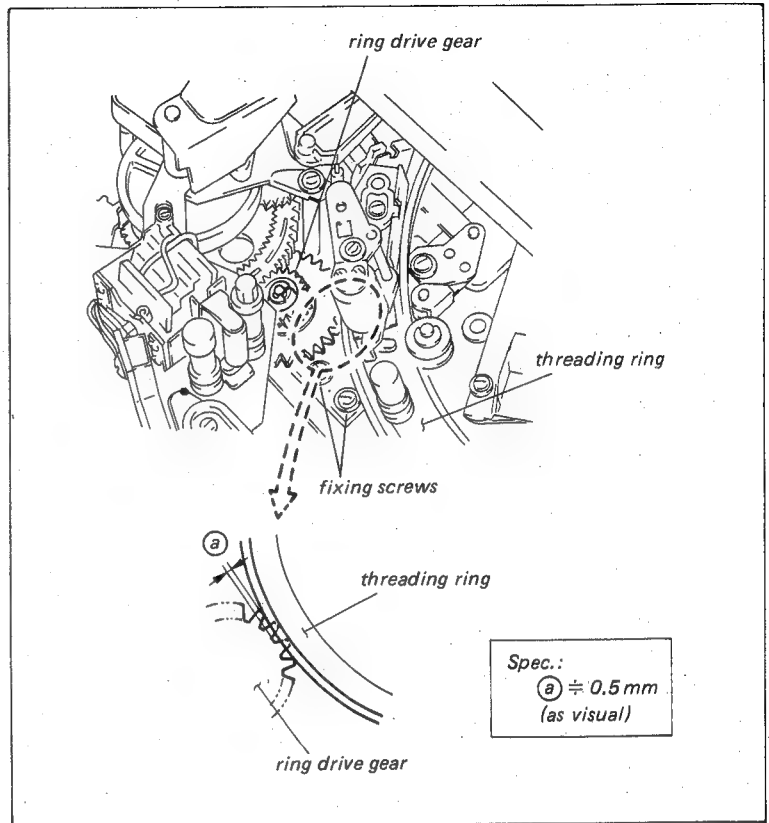
### 7-10-2. Ring Drive Gear Engagement Adjustment

**Mode:**

Engage the 5th guide in the V guide to turn the pulley of threading motor with finger.

**Adjustment procedure:**

- (1) Adjust the ring drive gear position so that the positional relationship between the ring drive gear and the threading ring meets the required specification.
- (2) Repeat the threading/unthreading mode two or three times and check that the rotation are smooth.
- (3) After adjustment, perform the Ring Sensor Position Adjustment.

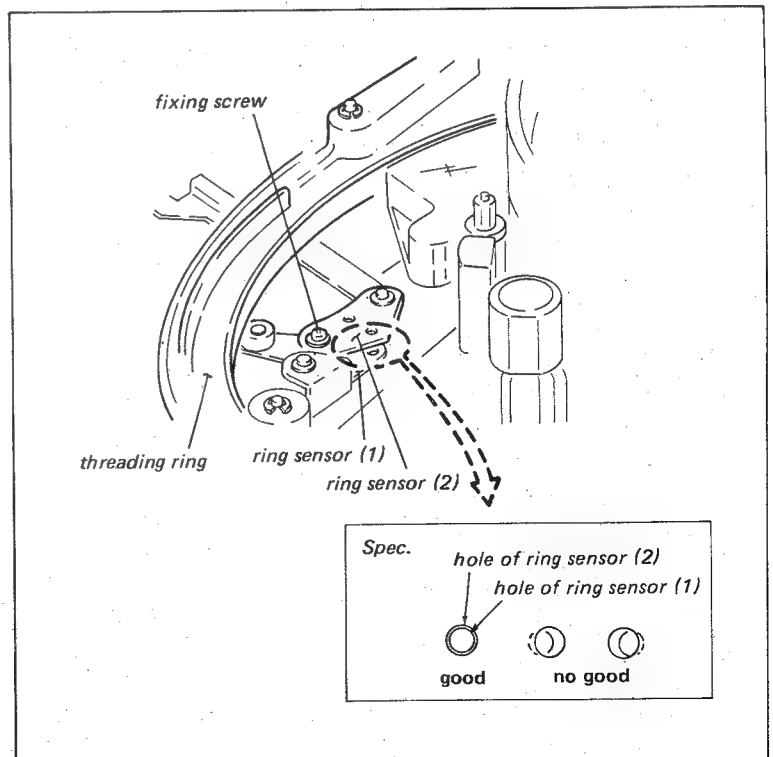


### 7-10-3. Ring Sensor Position Adjustment

**Mode:**EJECT completion

**Adjustment procedure:**

Remove the screw and put the ring sensors (1) and (2) so that the positional relationship of their holes meets the required specification.

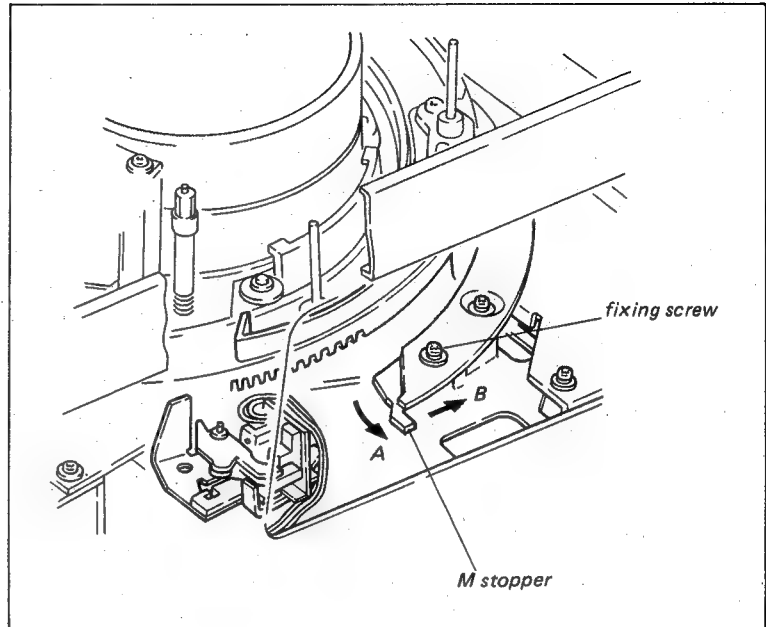




#### 7-10-4. M Stopper Mounting Position Adjustment

##### Adjustment procedure:

Install the M stopper to put aside the A and B directions as far as it will go.



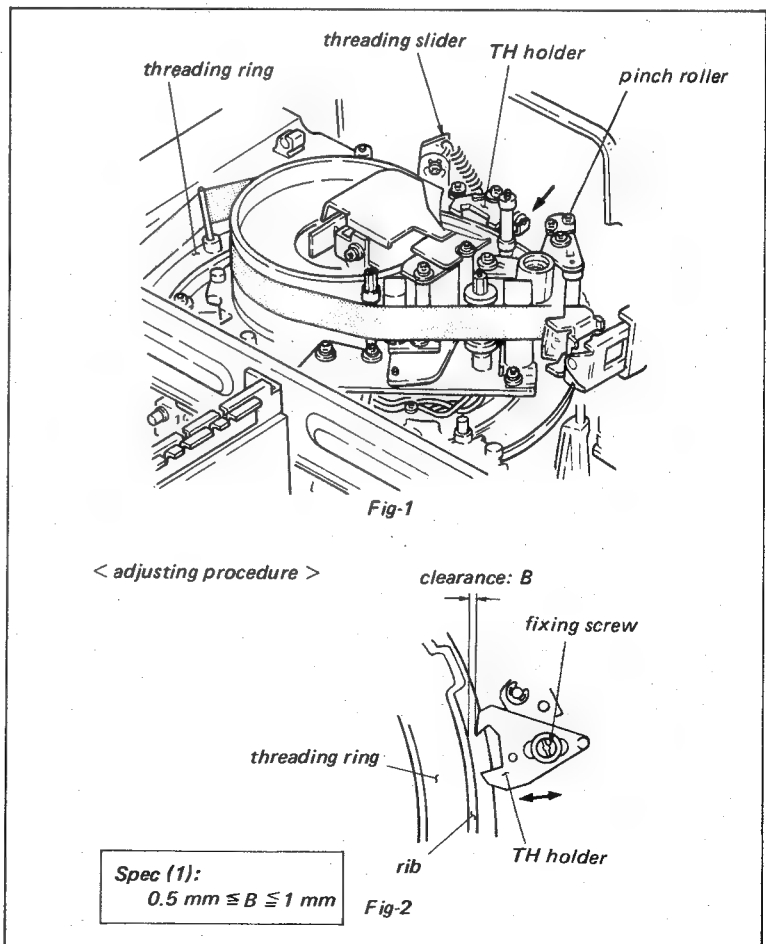
#### 7-10-5. TH Holder End Position Adjustment

##### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the end portion of the tape).
- (2) Turn off power in the moment when the pinch roller comes in front of the audio/CTL head.
- (3) Check that the clearance B meets the required specification (1) as shown in Fig.2. If not, perform the following adjustment.
- (4) Turn on power. Put the machine into the STOP mode.
- (5) Check that the positional relationship between the roller and the M stopper meets the required specification (2) as shown in Fig.3.
- (6) Repeat the EJECT and STOP modes two or three times. Check as procedure (5).

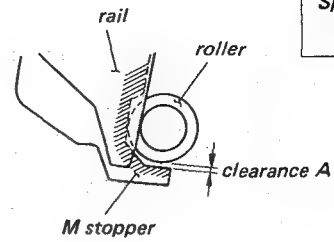
##### Adjustment procedure:

- (1) Adjust the position of the TH holder to meet the required specification (1).
- (2) After adjustment, check as procedures (4) to (6) of check procedure.





< viewing from A >



Spec (2):  
 $A \leq 1 \text{ mm}$

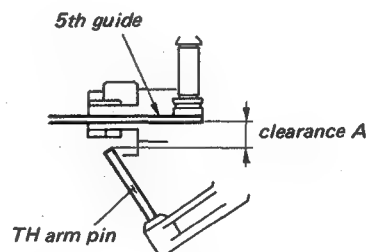
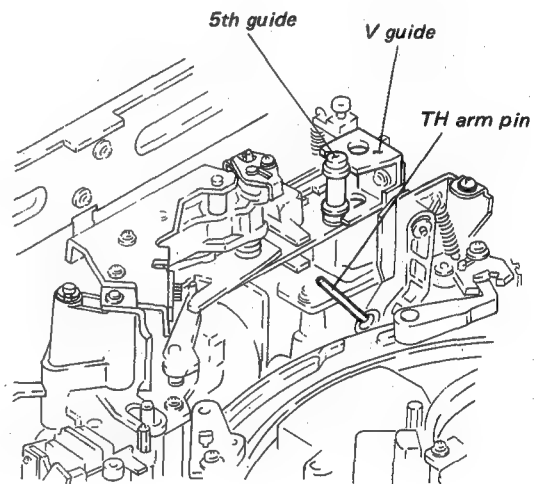
Fig-3

#### 7-10-6. Threading Slider EJECT Position Adjustment

Mode:EJECT completion

**Check procedure:**

Check that the clearance between the 5th guide and the TH arm pin meets the required specification.



Spec.:  
 $A \geq 0.5 \text{ mm}$



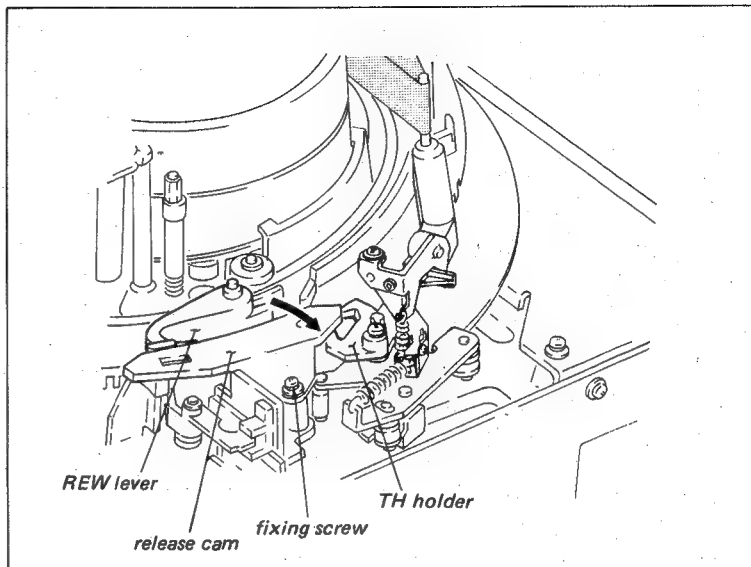
## 7-10-7. Release Cam Installing Position Adjustment

### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the beginning portion of the tape) and put the machine into the STOP mode.
- (2) After turn off the power, turn on again and put the machine into unthreading mode.
- (3) Check that the REW lever lockes to the TH holder.

### Adjustment procedure:

- (1) Adjust the position of the release cam in the direction of the arrow so that meets the specification.
- (2) After this adjustment, check as the check procedure.



## 7-10-8. Photo Coupler Cover Height Adjustment

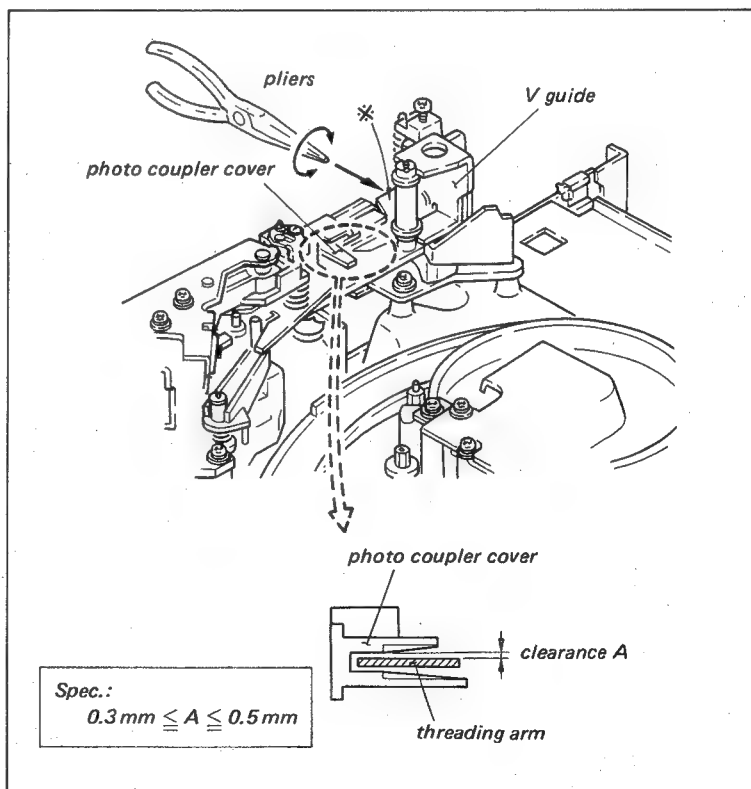
Mode:STOP

### Check procedure:

Check that the clearance between the threading arm and the photo coupler cover meets the required specification.

### Adjustment procedure:

Adjust to bend the \* marked portion of the V guide with pliers.



## 7-10-9. 5th Guide Operating Position Adjustment

Tool:KCS-20 cassette tape

Mode:STOP ← → EJECT

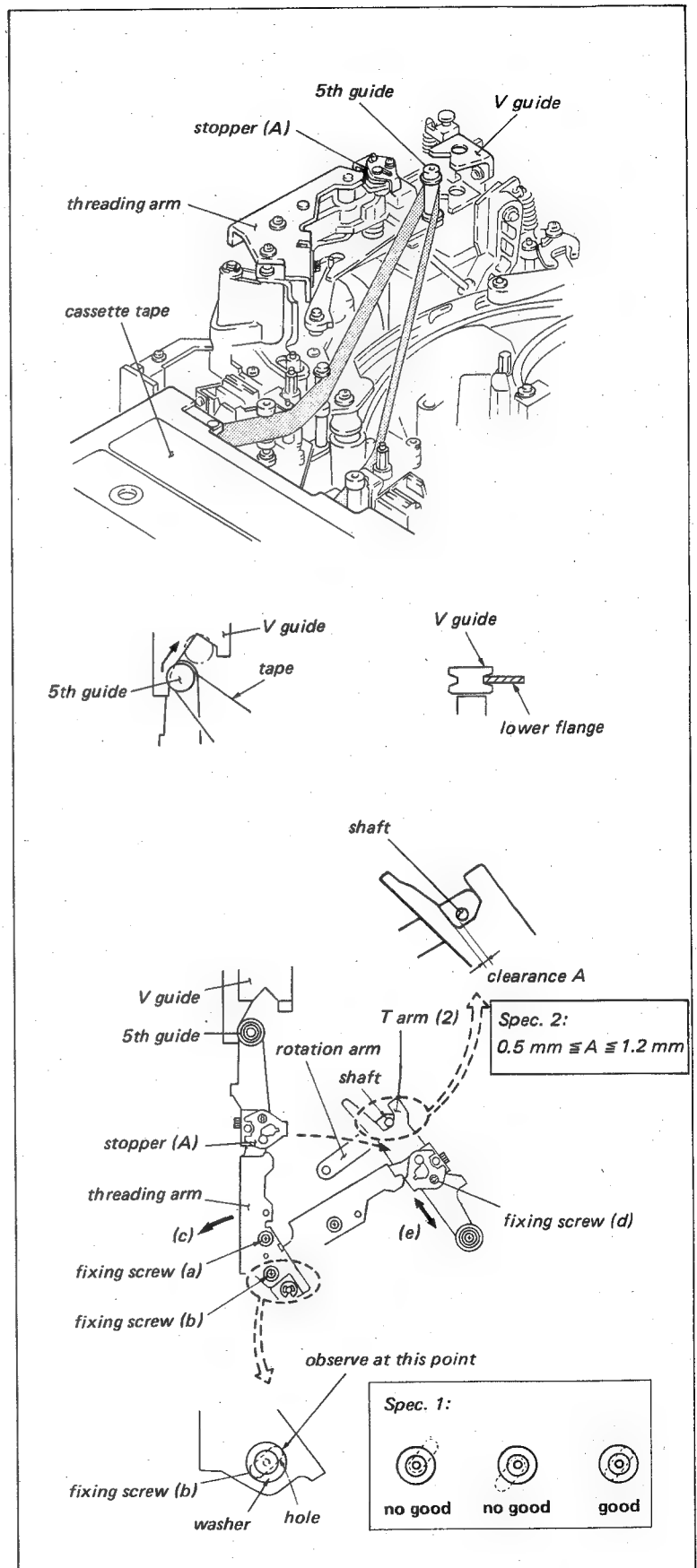


### Check procedure:

- (1) Energize the tape beginning/end sensors.
- (2) Put the KCS-20 cassette-tape (use the end portion of the tape). Turn the T reel hub in the counterclockwise direction with finger as far as it will go.
- (3) Insert the cassette-tape to the machine in the power off mode.
- (4) Turn on the power and put the machine into the threading mode. Check that the 5th guide fits the V guide as shown in figure.
- (5) Repeat the EJECT and STOP modes several times. Check again.

### Adjustment procedure:

- (1) Remove the cassette tape.
- (2) Put the machine into STOP mode. Put the 5th guide on the position as shown in figure according to turn the pulley of threading motor with finger.
- (3) Loosen the fixing screws (a) and (b), and slide the threading arm in the direction of the arrow (c). Adjust the position of threading arm so that the relationship between the washer of screw (b) and screw hole of threading arm meets the specification (1).
- (4) Turn the pulley of threading motor so that the T arm (2) is in the position as shown in figure.
- (5) Loosen the fixing screw (d) and then slide the stopper (A) in the direction of the arrow (e). Adjust that the positional relationship of the rotation arm shaft and the T arm (2) meets the specification (2) as shown in figure, and tighten the screw.





## 7-10-10. 5th Guide Unthreading Position Adjustment

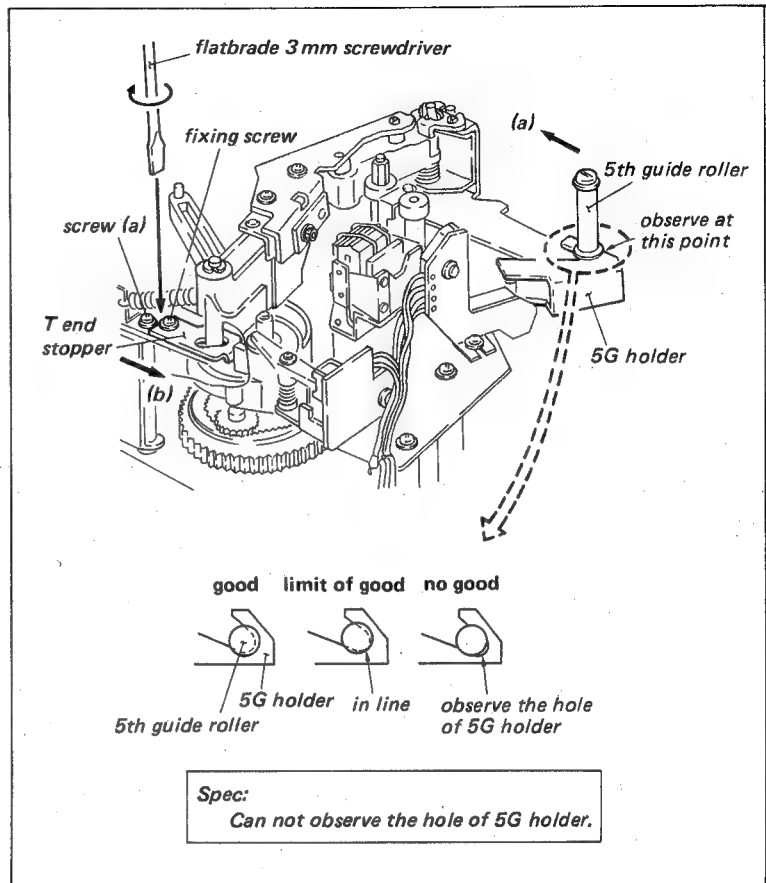
Mode: STOP → EJECT completion

### Check procedure:

- (1) Put the machine into STOP mode once and put into EJECT completion mode by pushing EJECT button.
- (2) Check that the clearance between the 5th guide and the 5G holder meets the required specification.

### Adjustment procedure:

- (1) Put the machine into the EJECT completion mode.
- (2) Loosen the fixing screw about two turns.
- (3) Rotate the pulley of the threading motor two or three turns so that the 5th guide roller fits into the 5G holder.
- (4) Tighten the fixing screw once, and loosen it about 1/2 turn.
- (5) Insert a flatbrade 3mm screwdriver between the T end stopper and the screw (a) and turn the screwdriver in the direction of the arrow. Move the T end stopper in the direction of the arrow (b) with the screwdriver until the 5th guide roller gets to move in the direction of the arrow (a) and tighten the screw.





### 7-10-11. T End Sensor Position Adjustment

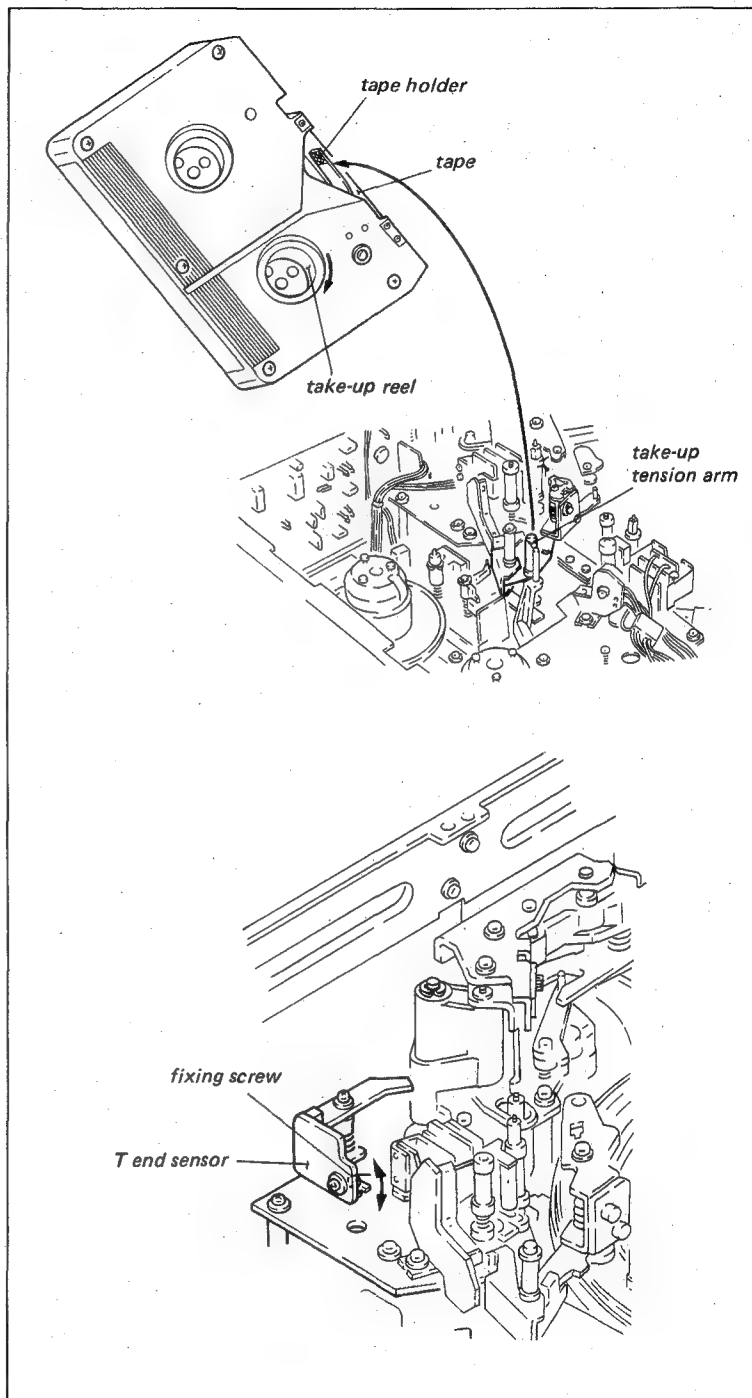
**Tool:** KCS-20 or KCA-60 cassette tape

#### **Check procedure:**

- (1) Turn off the power.
- (2) Turn the take-up reel hub of cassette tape with finger, and remove the slack of tape.
- (3) Fully open the lid of cassette tape and insert the cassette tape so that the take-up tension arm is placed between the cassette tape and the tape holder.
- (4) Turn the pulley of the gear box and bring the take-up tension arm into contact with the tape.
- (5) Turn on the power. Check that the machine is putted into the threading mode after the take-up tension arm moves toward the reel table side once.

#### **Adjustment procedure:**

Adjust the position of the T end sensor to meet the required specification.





## 7-10-12. Take-up Tension Arm, Unthreading Position Adjustment

**Tool:**KCS-20 or KCA-60 cassette tape

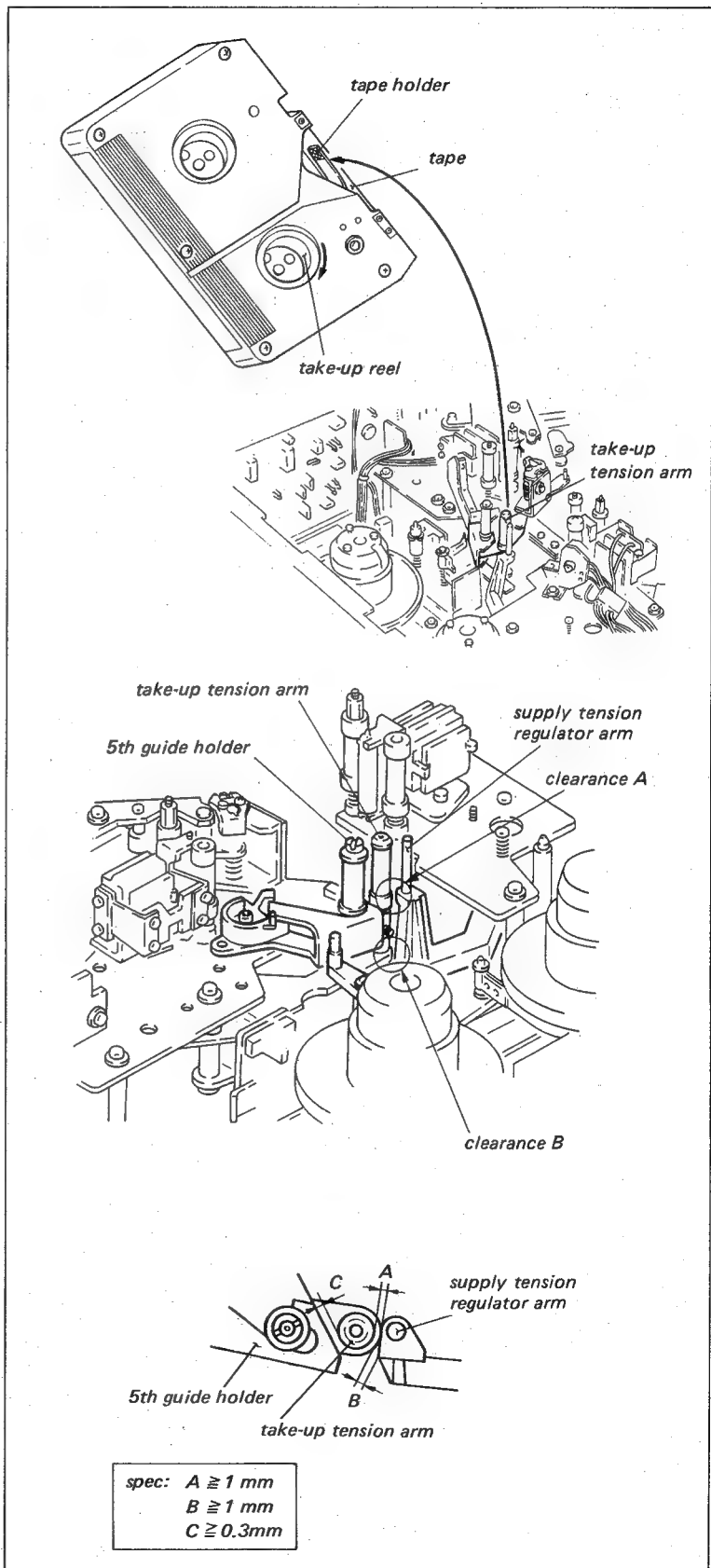
**Mode:**EJECT completion

### Check procedure:

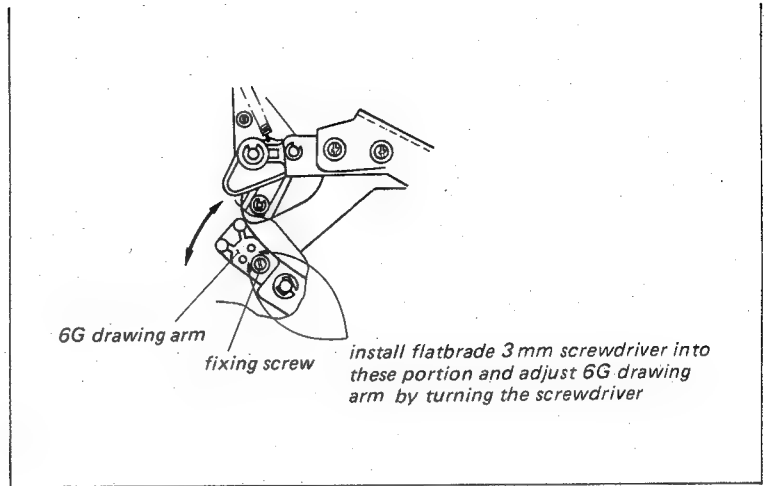
- (1) Turn the take-up reel hub of cassette tape with finger, and remove the slack of tape.
- (2) Fully open the lid of cassette tape and insert the cassette tape so that the take-up tension arm is placed between the cassette tape and the tape holder.
- (3) Check that the tape does not contact with the take-up tension arm.
- (4) Check that the positional relationship of the take-up tension arm, 5th guide holder and the S tension regulator arm meets the required specification.

### Adjustment procedure:

Adjust the position of the 6G drawing arm to meet the required specification.













## SECTION 8

### BACK TENSION AND TORQUE ALIGNMENT

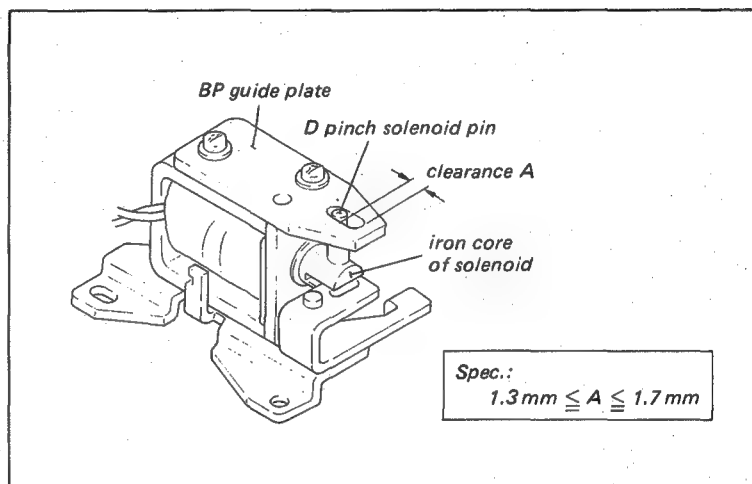
#### 8-1. BRAKE SOLENOID MOUNTING POSITION ADJUSTMENT

This machine has the brake solenoid independently for the supply and the take-up reel tables. Adjusting procedures of the supply and the take-up sides in the same way.

**Tool:** Thickness gauge

##### Adjustment procedure:

After the iron core of the solenoid is pushed with finger to set up the energized state, adjust the position of the BP guide plate to meet the required specification.



#### 8-2. BRAKE LEVER ADJUSTMENT

This machine has the reel brake independently for the supply and the take-up reel tables. Perform this adjustment independently for the T reel brake and the S reel brake.

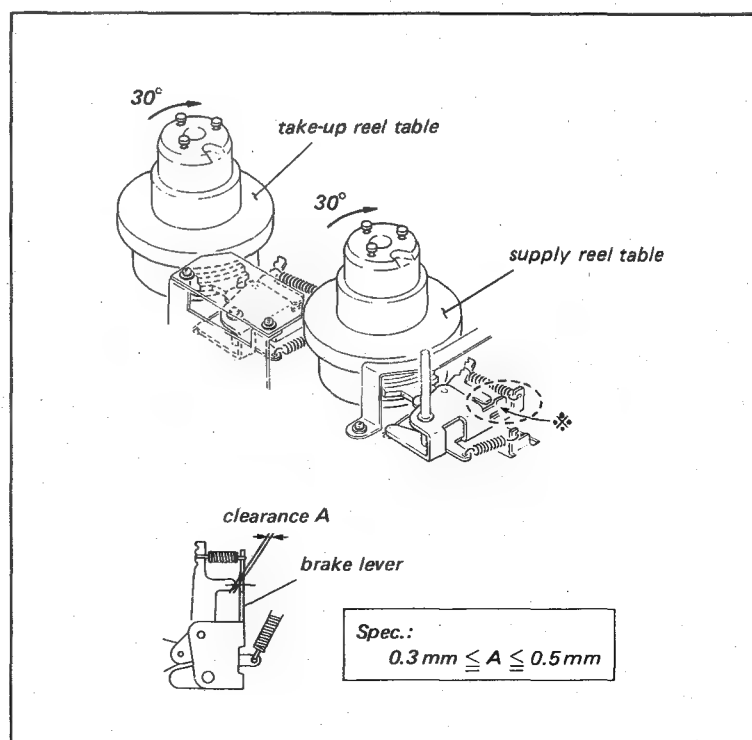
**Mode:** EJECT completion

##### Check procedure:

Grasp the reel table by hand and turn to the clockwise direction about 30 degrees. Check the clearance A to meet the required specification.

##### Adjustment procedure:

Bend the \* marked portion of the brake lever to meet the required specification with a pliers.





### 8-3. BRAKE TORQUE ADJUSTMENT

This machine has the reel brake independently for the supply and the take-up reel tables. Perform this adjustment independently for the T reel brake and the S reel brake.

**Tool:**

Reel table torque measurement tape  
(100 mm dia.)

Tension scale (200 g full scale)

**Preparation:**

Remove the handle bracket on the right side of the set.

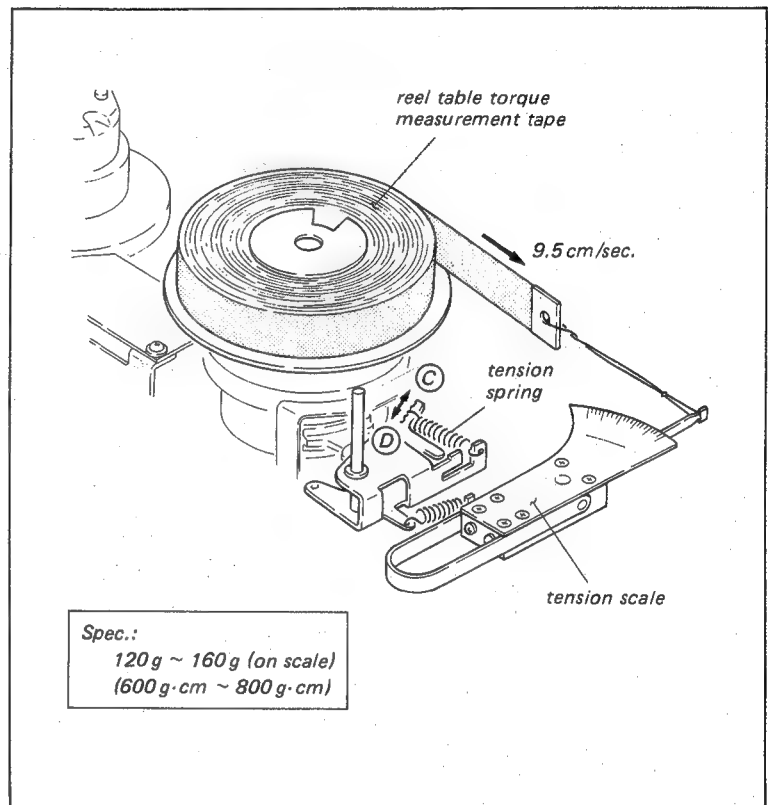
**Mode:**EJECT completion

**Check procedure:**

Install the jig tape on the reel table. Pull out the tape at a constant speed of approx 9.5 cm/sec. and confirm that the scale reading is in the specification.

**Adjustment procedure:**

- (1) Select the proper spring hook to meet the specification.
  - Ⓒ direction: increases brake torque
  - Ⓓ direction: decrease brake torque
- (2) If it is not to meet the specification, replace the brake shoe.





#### 8-4. FWD BACK TENSION ADJUSTMENT

##### Tool:

Back tension adjustment jig  
Reel table torque measurement tape  
(100 mm dia.)  
Tension scale (100 g fullscale)  
Allen wrench (each edge has 2 mm)

##### Preparation:

- (1) Mute the tape beginning sensor and tape end sensor.
- (2) Mute the TAPE PROTECTION and the THREADING MOTOR DISABLE signals.
- (3) Open the connector panel. Disconnect all connectors of the RP-10 board and remove the RP-10 board from the chassis.
- (4) Turn on the power and put the machine into PLAY mode.
- (5) Set the SKEW control knob to its center click (detent) position.
- (6) Install the back tension adjustment jig.
- (7) Install the jig tape on the supply reel table and thread a tape as shown in figure.

##### (CAUTION)

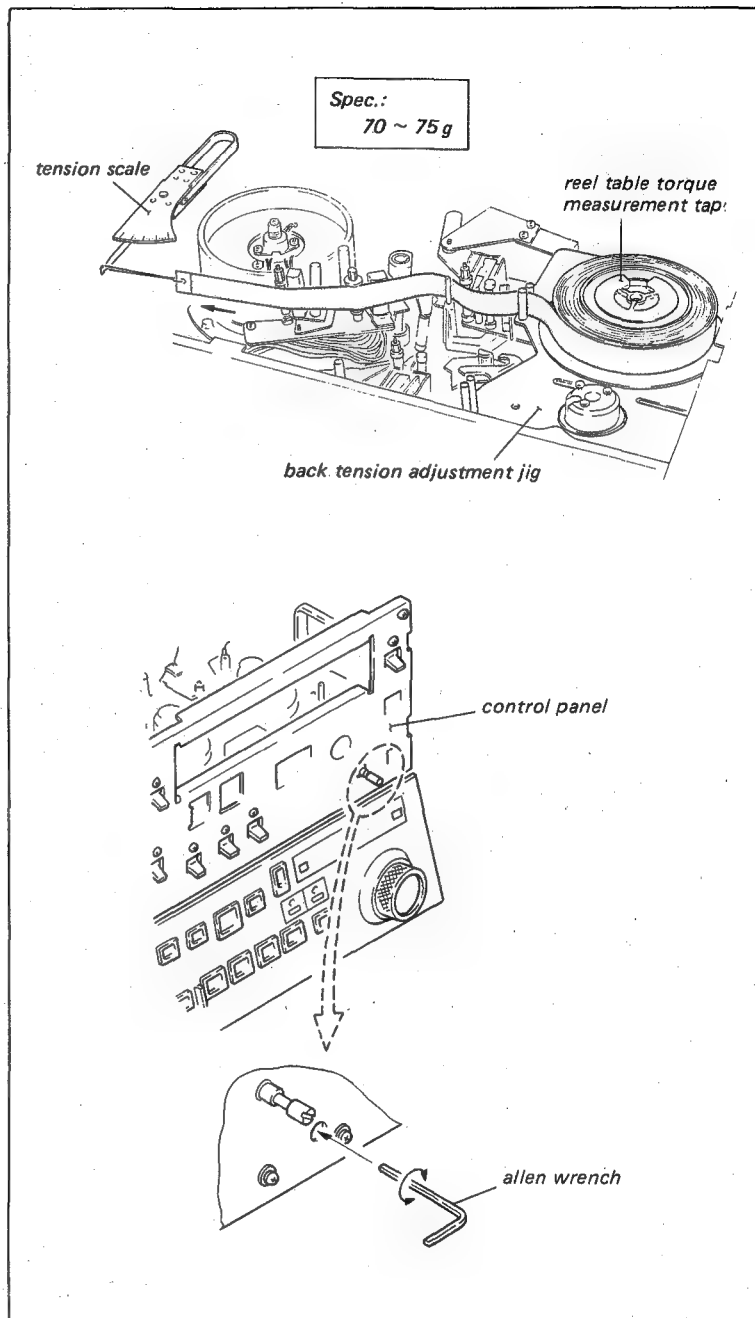
Take care that the head drum is rotating in a high speed.

##### Check procedure:

- (1) Hook a tension scale on an end of the tape. Pull out the tape at a constant speed of approx 9.5 cm/sec. and confirm that the scale reading is in the specification.
- (2) After check and adjustment, remove the jig tape and back tension adjustment jig. Press the EJECT button.

##### Adjustment procedure:

- (1) Insert the allen wrench into the hole on the control panel as shown in figure. And turn the hexagon socket screw to meet the adjustment specification.
- (2) If it is not to meet the specification, replace the brake band assembly.

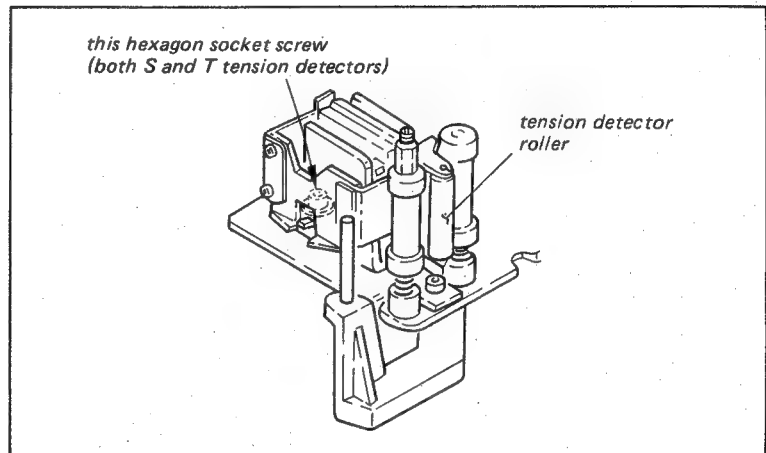




## 8-5. TENSION DETECTOR ADJUSTMENT

### (CAUTION)

Do not loosen the screw as in figure. The position of tension detector roller is determined by this screw. This screw is adjusted precisely with a jig in the factory.



### 8-5-1. Tension Detector Stopper Position Adjustment

This adjustment is required only when the tension detector is replaced or removed. This stopper controls the operating range of the tension detector.

If this adjustment is poor, the optimum tape tension and the normal tape movement being not expected.

This machine has tension detectors at the supply and the take-up reel sides. The adjustment procedure described is only for the take-up side but can be applied on the operation at the supply side.

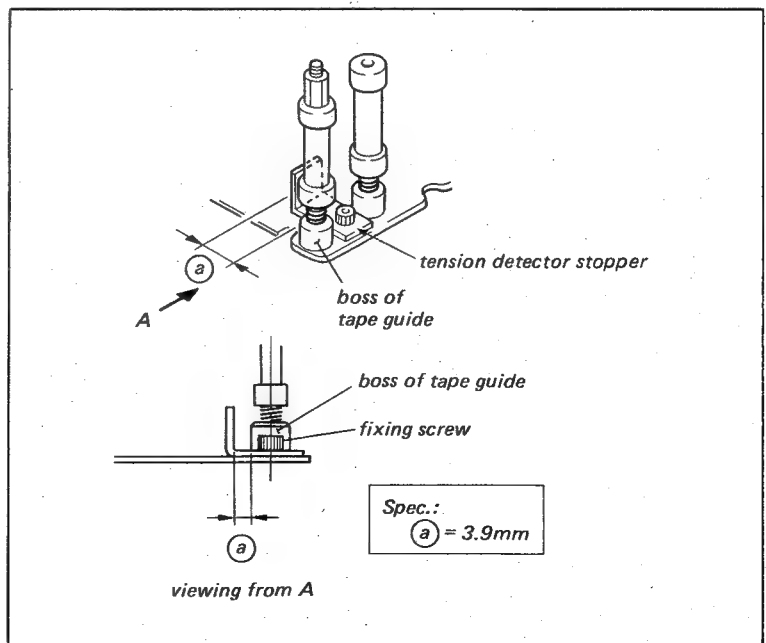
**Tool:** Slide vernier caliper or equivalent

#### Check procedure:

Check that the positional relationship between tape guide shaft and stopper to meet the specification.

#### Adjustment procedure:

Adjust the position of the stopper to meet the required specification.





### 8-5-2. T Tension Detector Roller Zenith Adjustment

This adjustment is performed to install the tension detector in the machine.

#### Tool:

Allen wrench (each edge has 2 mm)  
Flatness plate

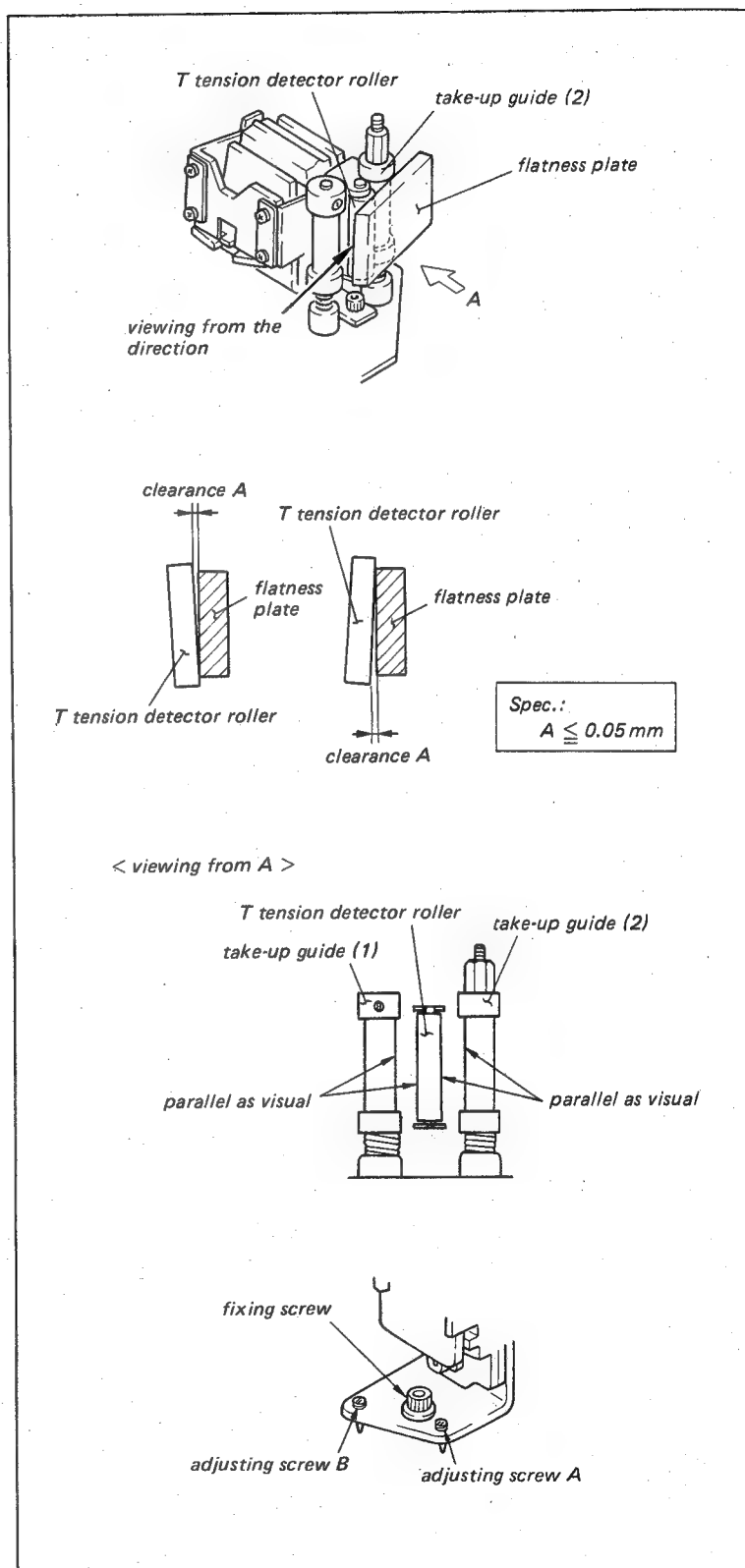
Mode:STANDBY

#### Check procedure:

- (1) Check that the clearance between the detector roller and the flatness plate meets the required specification, when the flatness plate is set on the take-up guide (2) as shown in figure and the flatness plate is touched lightly with the T tension detector roller.
- (2) Check that the tension detector roller parallels with the take-up guide (1) and (2) viewing from the direction of the arrow A.

#### Adjustment procedure:

- (1) If the check procedure (1) is out of specification.  
When the clearance is out of spec. at the top portion, loosen the fixing screw and turn the adjusting screw (A) in clockwise direction. Tighten the fixing screw and check zenith again.  
When the clearance is out of spec. at the bottom portion, turn the adjusting screw (A) in counterclockwise direction. Tighten the fixing screw and check zenith again.
- (2) If the check procedure (2) is out of specification.  
When the clearance is out of spec. at the top portion. loosen the fixing screw and turn the adjusting screws (A) and (B) of exactly equal amount in clockwise direction. Tighten the fixing screw and check zenith again.





When the clearance is out of spec. at the bottom portion, turn the adjusting screws (A) and (B) of exactly equal amount in counterclockwise direction. Tighten the fixing screw and check zenith again.

### 8-5-3. S Tension Detector Roller Zenith Adjustment

This adjustment is performed to install the tension detector in the machine.

**Tool:**

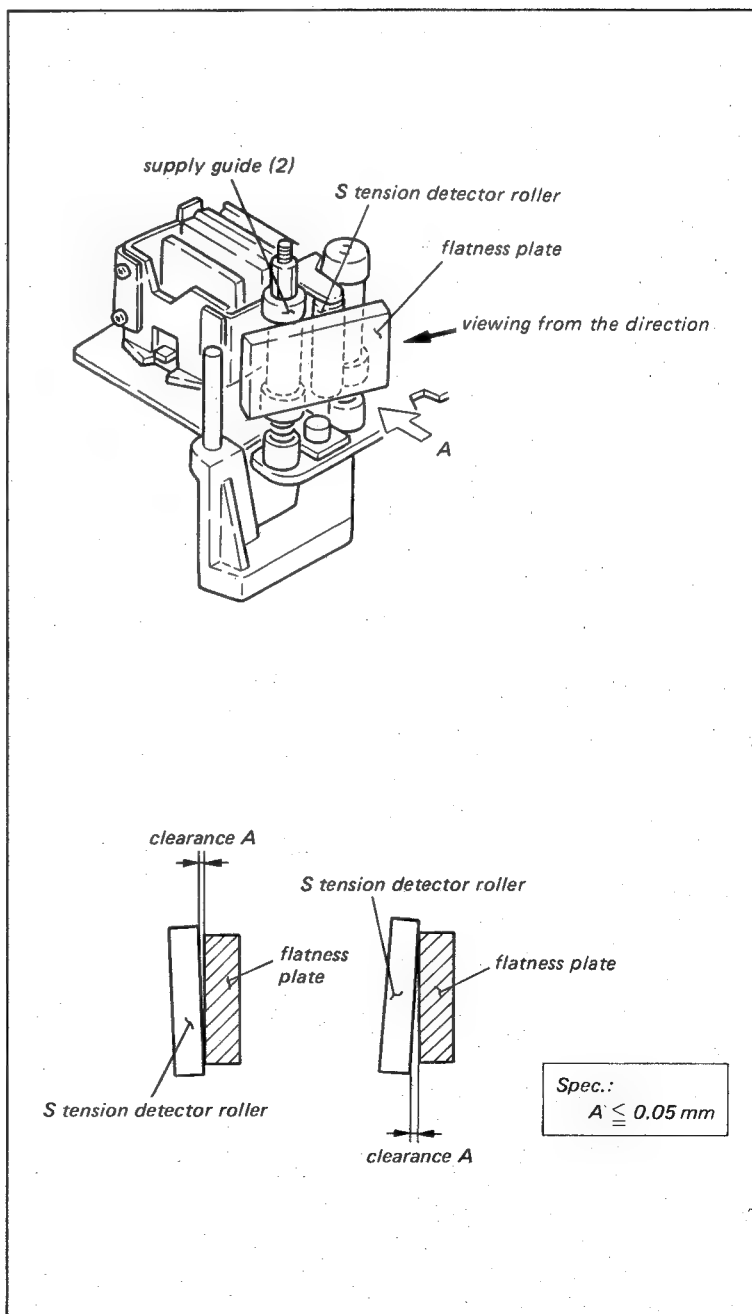
Flatness plate

Allen wrench (each edge has 2 mm)

**Mode:**STANDBY

**Check procedure:**

- (1) Check that the clearance between the detector roller and the flatness plate meets the required specification, when the flatness plate is set on the supply guide (2) as shown in figure and the flatness plate is touched lightly with the S tension detector roller
- (2) Check that the tension detector roller parallels with the supply guide (1) and (2) viewing from the direction of the arrow A.





**Adjustment procedure:**

- (1) If the check procedure (1) is out of specification.

When the clearance is out of spec. at the top portion, loosen the fixing screw and turn the adjusting screw (A) in clockwise direction. Tighten the fixing screw and check zenith again.

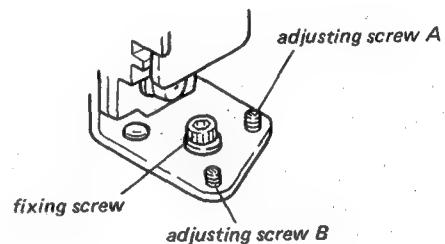
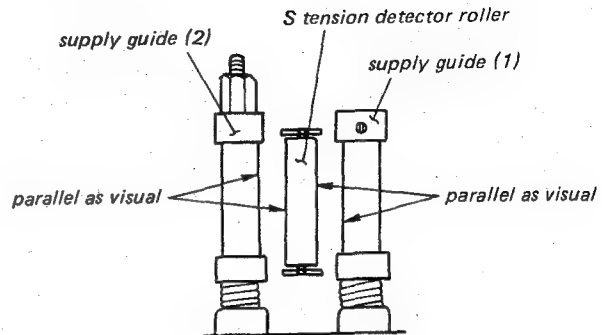
When the clearance is out of spec. at the bottom portion, turn the adjusting screw (A) in counterclockwise direction. Tighten the fixing screw and check zenith again.

- (2) If the check procedure (2) is out of specification.

When the clearance is out of spec. at the top portion, loosen the fixing screw and turn the adjusting screws (A) and (B) of exactly equal amount in counterclockwise direction. Tighten the fixing screw and check zenith again.

When the clearance is out of spec. at the bottom portion, turn the adjusting screws (A) and (B) of exactly equal amount in clockwise direction. Tighten the fixing screw and check zenith again.

< viewing from A >





## 8-6. OPERATION CHECK AND ADJUSTMENT OF TENSION DETECTOR

The operational points of the supply side and take-up side tension detectors are determined at the two points i.e. the 0 g tape tension point and the 100 g tape tension point. Here the check and adjustment for operational point are described.

### 8-6-1. Supply Tension Detector 0 Gram Point Adjustment

Mode:EJECT

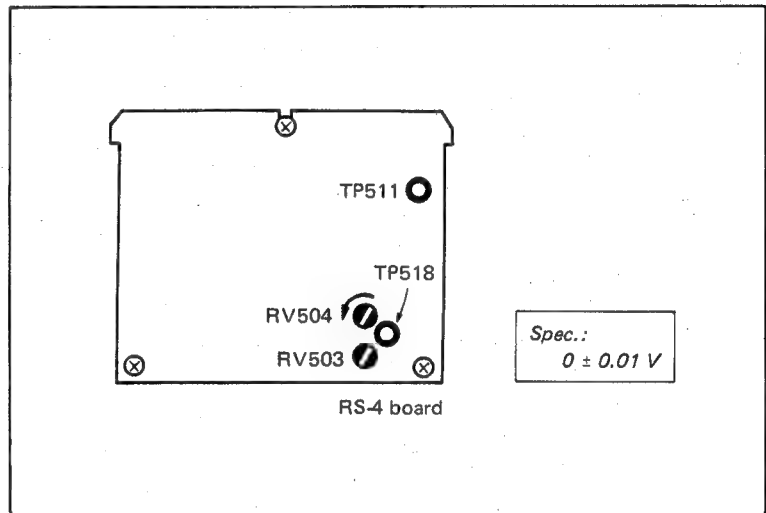
#### Tool:

Extension board

DC boltmeter (Digital multimeter)

#### Preparation:

- (1) Turn the RV504/RS-4 board to the counterclockwise direction as far as it will go. Do not turn these variable resistors except when the RS-4 board replacement is performed.
- (2) Connect (-) terminal/DC voltmeter to TP511/RS-4 board and (+) terminal/DC voltmeter from TP518/ RS-4 board.
- (3) Turn on the power.



#### Check procedure:

Check that the indication of DC voltmeter meets the required specification.

#### Adjustment procedure:

Adjust the RV503/RS-4 board to meet the required specification.



## 8-6-2. Take-up Tension Detector 0 Gram Point Adjustment

Mode:EJECT

### Tool:

Extension board

DC voltmeter (Digital multimeter)

### Preparation:

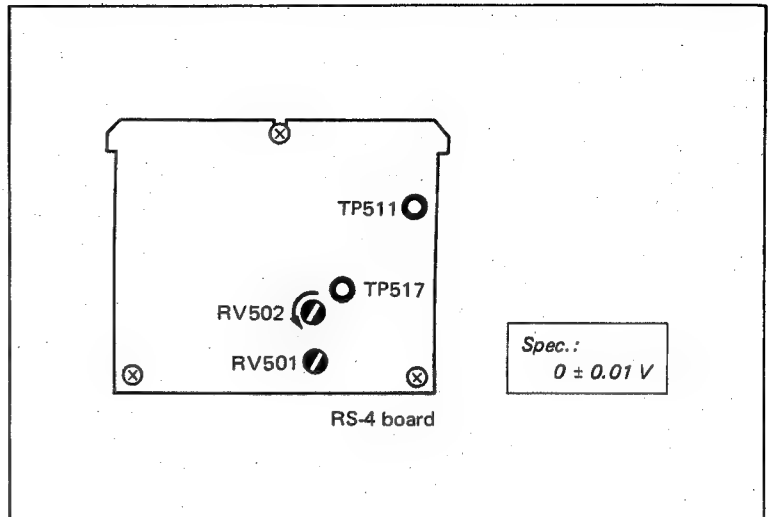
- (1) Turn the RV502/RS-4 board to the counterclockwise direction as far as it will go. Do not turn these variable resistors except when the RS-4 board replacement is performed.
- (2) Connect (-) terminal/DC voltmeter to TP511/RS-4 board and (+) terminal/DC voltmeter to TP517/RS-4 board.
- (3) Turn on the power.

### Check procedure:

Check that the indication of DC voltmeter meets the required specification.

### Adjustment procedure:

Adjust the RV501/RS-4 board to meet the required specification.





### 8-6-3. Supply Tension Detector 100 Gram Point Adjustment

Mode:STANDBY

#### Tool:

DC voltmeter (Digital multi-meter)

Locally-Specially-Made-Tape  
(prepare this tape referring follows)

Cut a tape into 20 cm long. Attach an adhesive tape on an end of the tape as shown in figure. Make a hole on the adhesive tape. Make a loop of 6 cm long string through the hole. Make a circle about 1 cm dia. from another end of the tape and fix the tape by a adhesive tape.

Tension scale (100 g full scale)  
Extension board

#### Preparation:

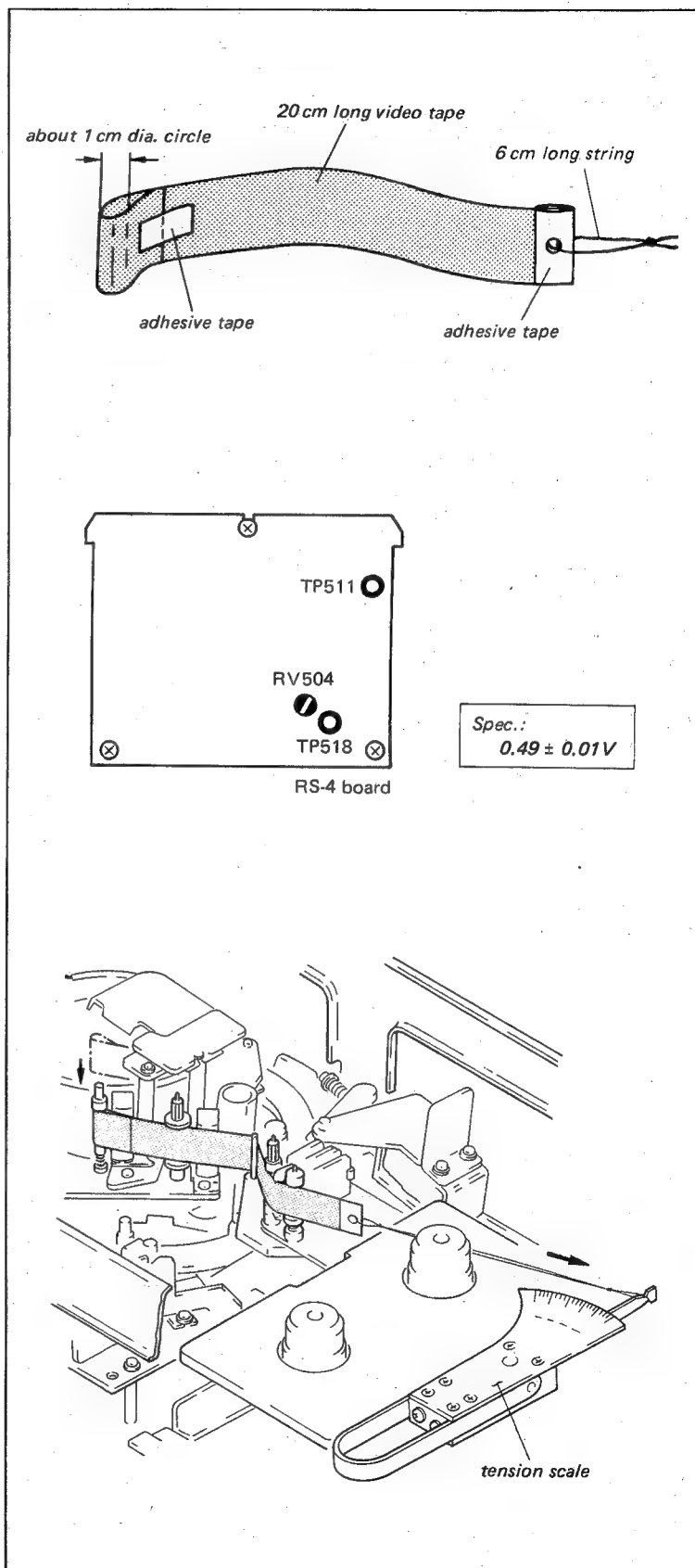
- (1) Connect (-) terminal/DC voltmeter to TP511/RS-4 board and (+) terminal/DC voltmeter to TP518/RS-4 board.
- (2) Mute the tape beginning sensor and tape end sensor.
- (3) Mute the TAPE PROTECTION and the THREADING MOTOR DISABLE signals.
- (4) Put the machine into the STOP mode. Grasp the take-up and supply reel tables by hand and press the STANDBY button.

#### Check procedure:

- (1) Thread the special jig tape as shown in figure, and hook a tension scale on an end of the tape.
- (2) Move the tension scale slowly to as shown in figure direction and sets the scale  $100 \pm 5$  g. When the scale reading is over 105 g, put the tension scale reading into 80 g once, and sets the scale  $100 \pm 5$  g.
- (3) Check that the indication of the DC voltmeter meets the required specification.

#### Adjustment procedure:

Adjust the RV504 to meet the required specification.





#### 8-6-4. Take-up Tension Detector 100 Gram Point Adjustment

Mode:STANDBY

**Tool:**

DC voltmeter (Digital multimeter)  
Locally-Specially-Made-Tape  
(referring sec. 8-6-3)  
Tension scale (100 g full scale)  
Extension board

**Preparation:**

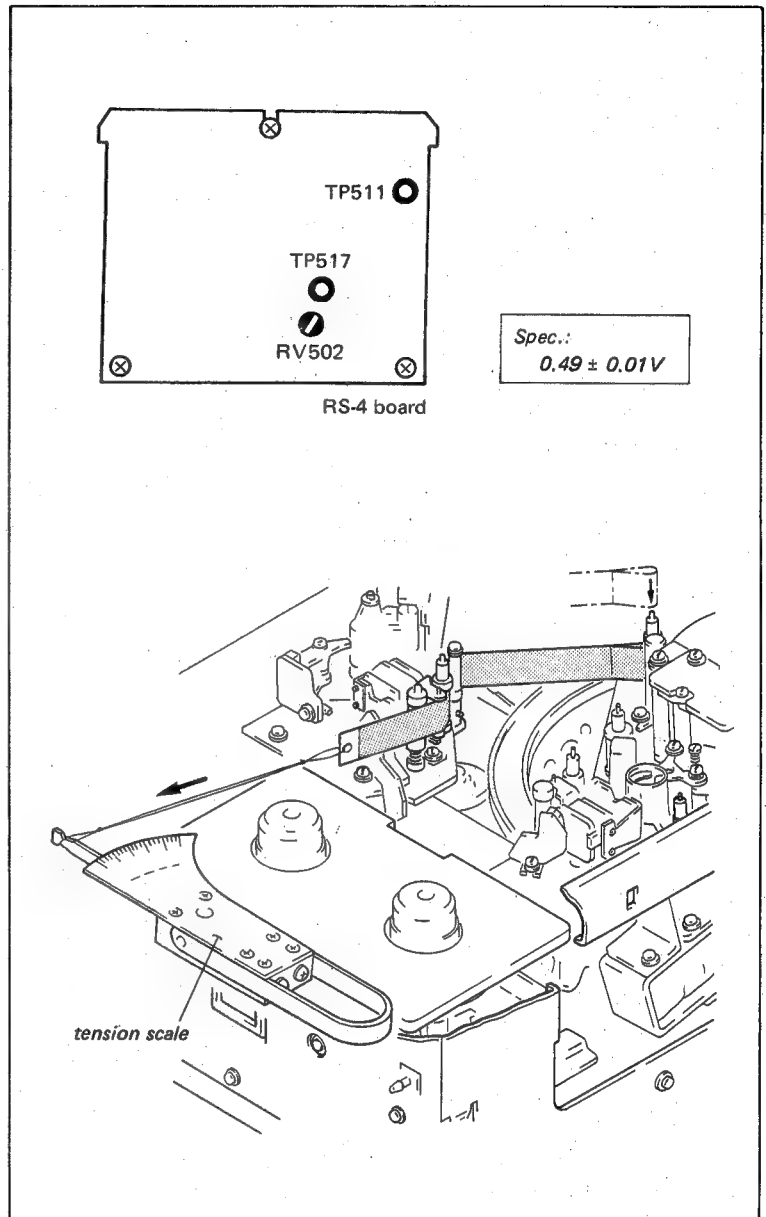
- (1) Connect (-) terminal/DC voltmeter to TP511/RS-4 board and (+) terminal/DC voltmeter to TP517/RS-4 board.
- (2) Mute the tape beginning sensor and tape end sensor.
- (3) Mute the TAPE PROTECTION and the THREADING MOTOR DISABLE signals.
- (4) Put the machine into the STOP mode. Grasp the take-up and supply reel tables by hand and press the STANDBY button.

**Check procedure:**

- (1) Thread the special jig tape as shown in figure, and hook a tension scale on an end of the tape.
- (2) Move the tension scale slowly to as shown in figure direction and sets the scale  $100 + 5$  g. When the scale reading is over 105 g, put the tensin scale reading into 80 g once, and sets the scale  $100 + 5$  g.
- (3) Check that the indication of the DC voltmeter meets the required specification.

**Adjustment procedure:**

Adjust the RV502 to meet the required specification.





## 8-7. TAKE-UP REEL MOTOR CURRENT SENSITIVE ADJUSTMENT

Mode:EJECT completion

### Tool:

Extension board  
Reel table torque measurement tape  
(100 mm dia.)  
Tension scale (100 g full scale)  
DC voltmeter  
Constant current power supply

### Preparation:

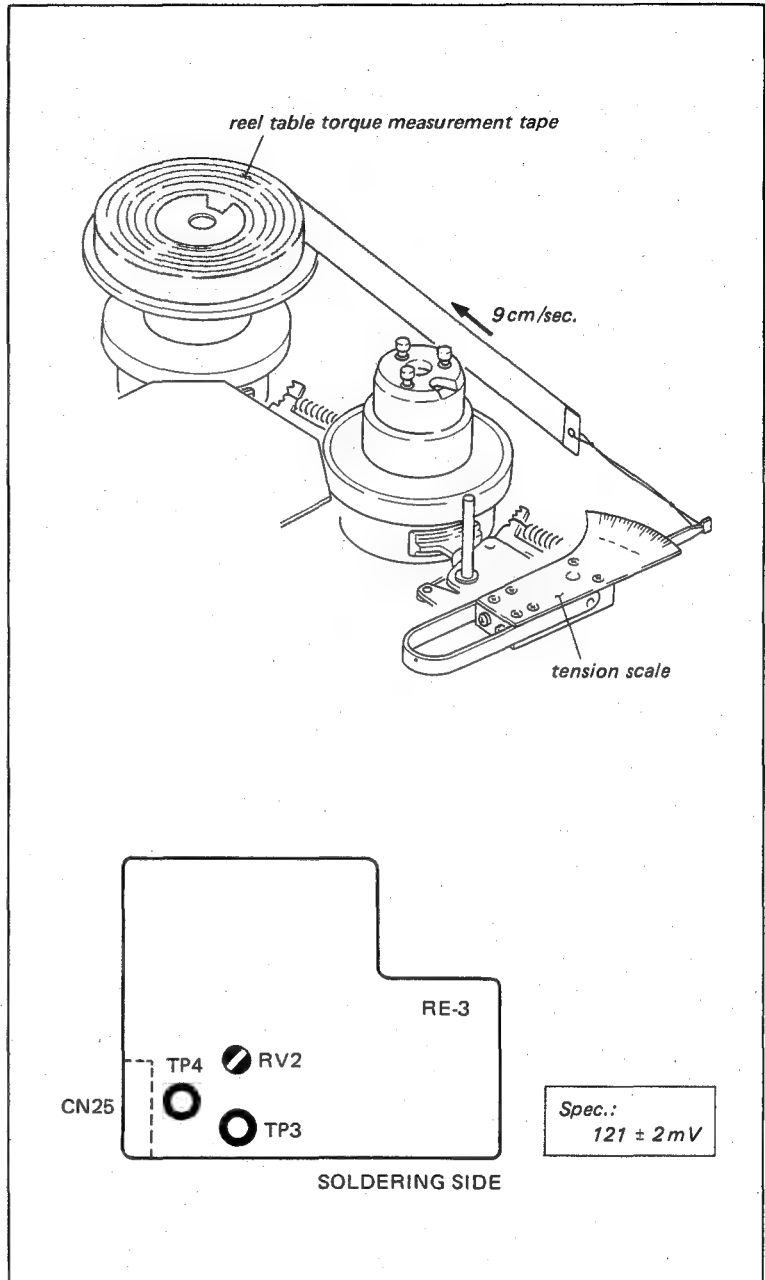
- (1) Remove the RS-3 board and insert the extension board. Do not insert the RS-3 board into the end of the extension board.
- (2) Disconnect the CN25 on the RE-3 board.
- (3) Turn on the power. Check that the take-up side reel brake is released.
- (4) Connect (-) terminal of the constant current power supply to TP3/RE-3 board, and (+) terminal to TP4/RE-3 board.
- (5) Connect (-) terminal of the DC voltmeter to A15/Extension board, and (+) terminal to A16/Extension board
- (6) Install the torque measurement tape on the take-up reel table.

### Check procedure:

- (1) Turn the CURRENT control knob of the constant current power supply slightly, perform the procedure (2).
- (2) Hook a tension scale on an end of the tape as shown in figure and let the tape pulled at a constant speed of approx.9 cm/sec. and repeat the procedure (1) and (2) until the scale reading comes to  $96 \pm 4$  g.  
(If the measuring value fluctuates, take the average reading of the tension scale.)
- (3) When the scale reading is  $96 \pm 4$  g, check that the voltmeter reading meets the required specification.

### Adjustment procedure:

Adjust the RV2/RE-3 board to meet the required specification.





## 8-8. SUPPLY REEL MOTOR CURRENT SENSITIVE ADJUSTMENT

**Mode:**EJECT completion

**Tool:**

Extension board  
Reel table torque measurement tape  
(100 mm dia.)  
Tension scale (100 g full scale)  
DC voltmeter  
Constant current power supply

**Preparation:**

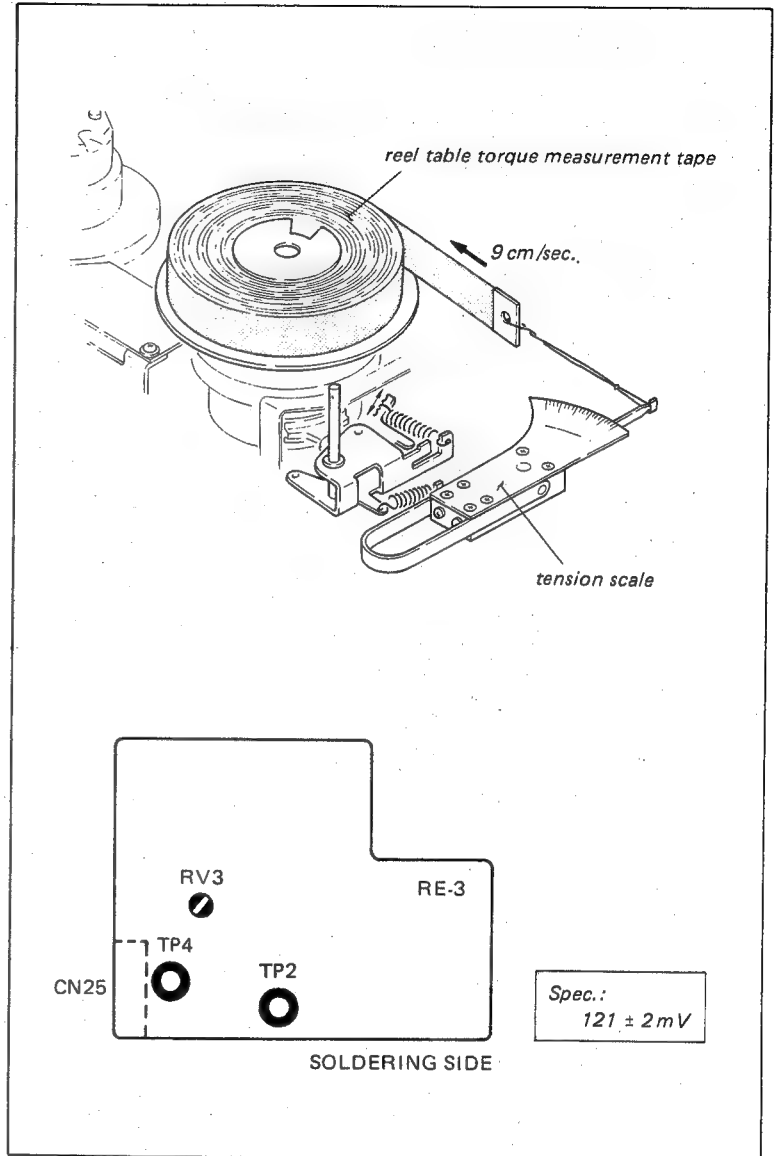
- (1) Remove the RS-3 board and insert the extension board. Do not insert the RS-3 board into the end of the extension board.
- (2) Disconnect the CN25 on the RE-3 board.
- (3) Release the supply side reel brake.
- (4) Turn on the power.
- (5) Connect (-) terminal of the constant current power supply to TP2/RE-3 board, and (+) terminal to TP4/RE-3 board.
- (6) Connect (-) terminal of the DC voltmeter to A17/Extension board, and (+) terminal to A18/Extension board
- (7) Install the torque measurement tape on the supply reel table.

**Check procedure:**

- (1) Turn the CURRENT control knob of the constant current power supply slightly, perform the procedure (2).
- (2) Hook a tension scale on an end of the tape as shown in figure and let the tape pulled at a constant speed of approx. 9 cm/sec. and repeat the procedures (1) and (2) until the scale reading comes to  $96 \pm 4$  g.  
(If the measuring value fluctuates, take the average reading of the tension scale.)
- (3) When the scale reading is  $96 \pm 4$  g, check that the voltmeter reading meets the required specification.

**Adjustment procedure:**

Adjust the RV3/RE-3 board to meet the required specification.





## 8-9. DME FG OUTPUT CHECK

EM-1 Board Mounting Position Adjustment should be completed before initiating this adjustment.

### Tool:

Extension board

Oscilloscope

### Preparation:

- (1) Remove the RS-3 board and insert the extension board into this position. Insert the RS-3 board into the end of the extension board.
- (2) Turn the RV502 and RV504 on the RS-4 board in the clockwise direction as far as it will go. Do not turn these variable resistors except when the RS-4 board replacement is performed.
- (3) Mute the TAPE PROTECTION signal
- (4) Connect the oscilloscope to TP20, 21, 22 or 23 on the RS-3 board as following the check procedures and connect the ground to E 2.
- (5) Turn on the power.

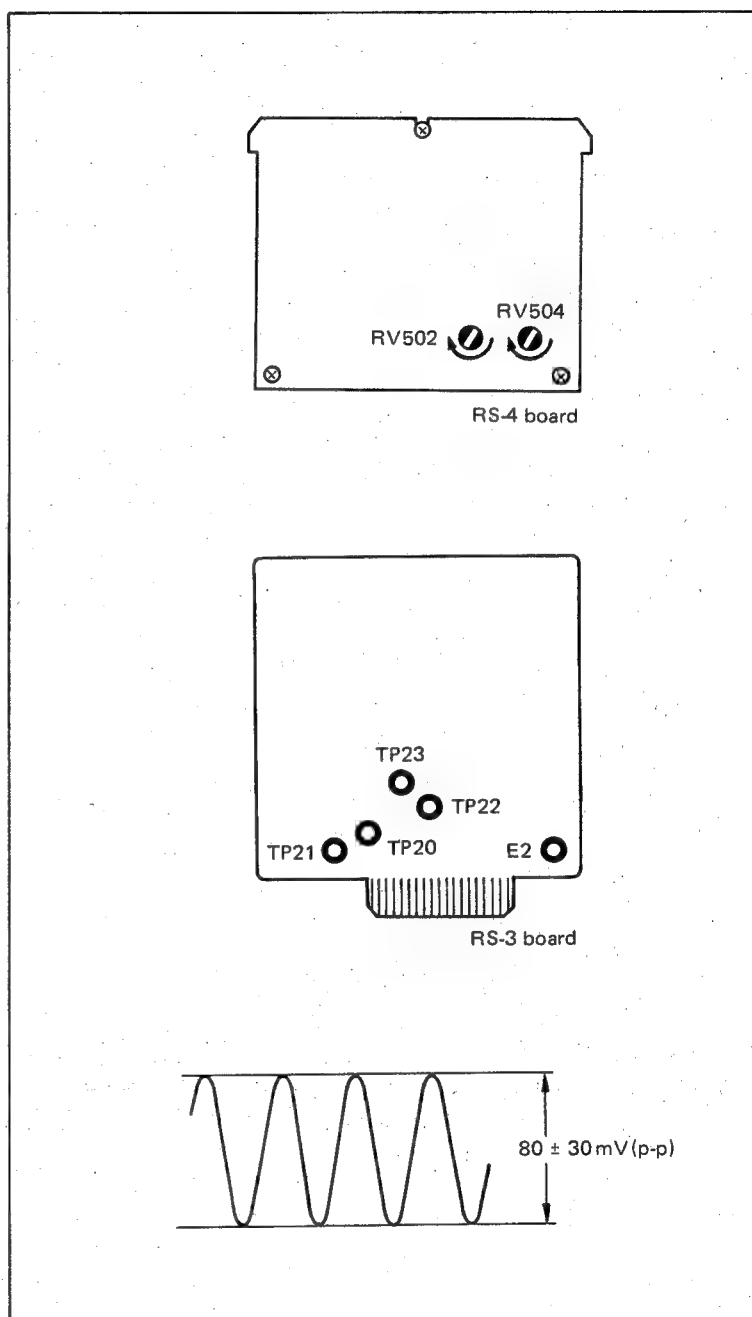
### Check procedure:

- (1) When the take-up reel table is turned to the counterclockwise direction by hand, check that the TP20 and 21 outputs meet the required specification.
- (2) When the supply reel table is turned to the counterclockwise direction by hand, check that the TP22 and 23 outputs meet the required specification.

### Adjustment procedure:

If it is not, replace DME and check again.

After this adjustment, perform the sec. 8-6-3 Supply Tension Detector 100 Gram Point Adjustment and sec. 8-6-4 Take-up Tension Detector 100 Gram Point Adjustment.





## SECTION 9

### TAPE RUN ALIGNMENT

#### 9-1. PINCH ROLLER ADJUSTMENT

##### 9-1-1. Pinch Lever Right Angle Adjustment

This adjustment is precisely factory-calibrated before shipment so that no adjustment is required except the pinch lever and the capstan shaft replacements.

**Tool:** Pinch lever adjustment jig

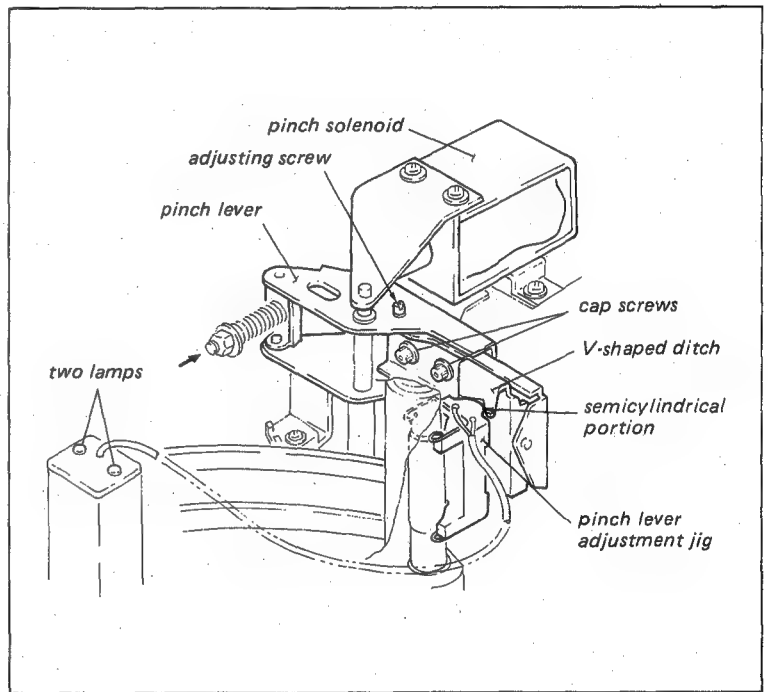
**Mode:** EJECT Completion

##### Check procedure:

- (1) Install the pinch lever adjustment jig taking care not to give scar on the capstan.
- (2) Push the pinch lever until V-shaped ditch of the pinch lever contacts the semicylindrical portion of the jig lightly. Check that the two lamps of the jig light at the same time.

##### Adjustment procedure:

- (1) Loosen the two cap screws of the pinch lever and adjust the adjusting screw.
- (2) After this adjustment, tighten the cap screws and check again.





### 9-1-2. Pinch Roller Stopper Position Adjustment

If the clearance is narrower than the specification, the possible trouble is that the pinch roller pressure against the capstan shaft may be so low that the tape will not be advanced at the proper speed.

If, in opposite, the clearance is too much, it is possible that the iron core is not engaged.

**Tool:** Thickness gauge

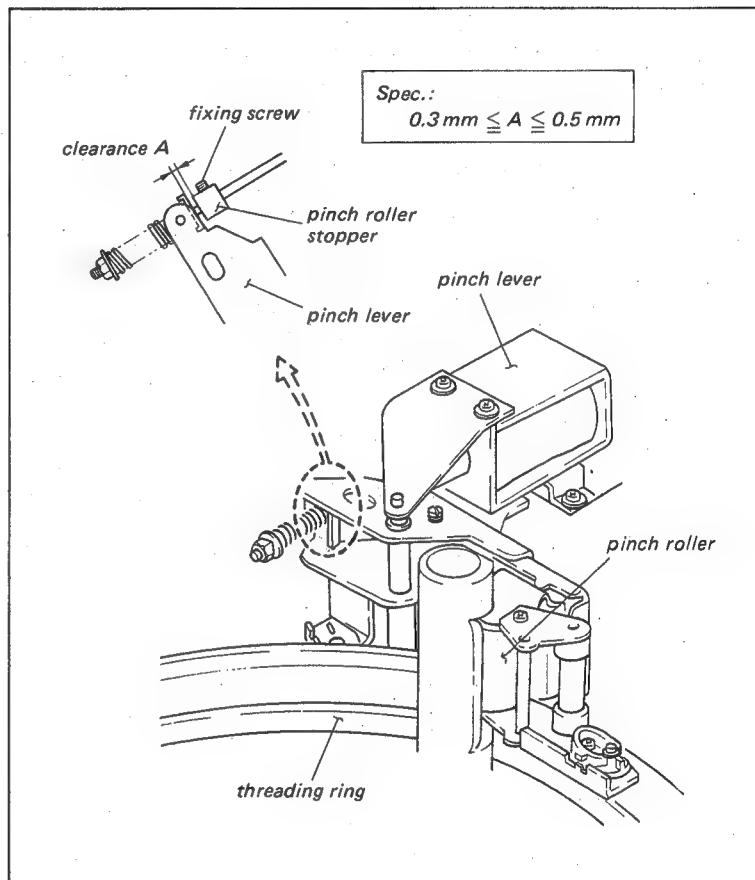
**Mode:** PLAY

#### Check procedure:

- (1) Check that the clearance between the pinch roller stopper and the pinch lever meets the required specification using a thickness gauge.
- (2) Repeat pressing the PLAY and STOP buttons two or three times and check that the clearance.

#### Adjustment procedure:

Adjust the position of the pinch roller stopper.





### 9-1-3. Pinch Roller Self-Alignment Adjustment

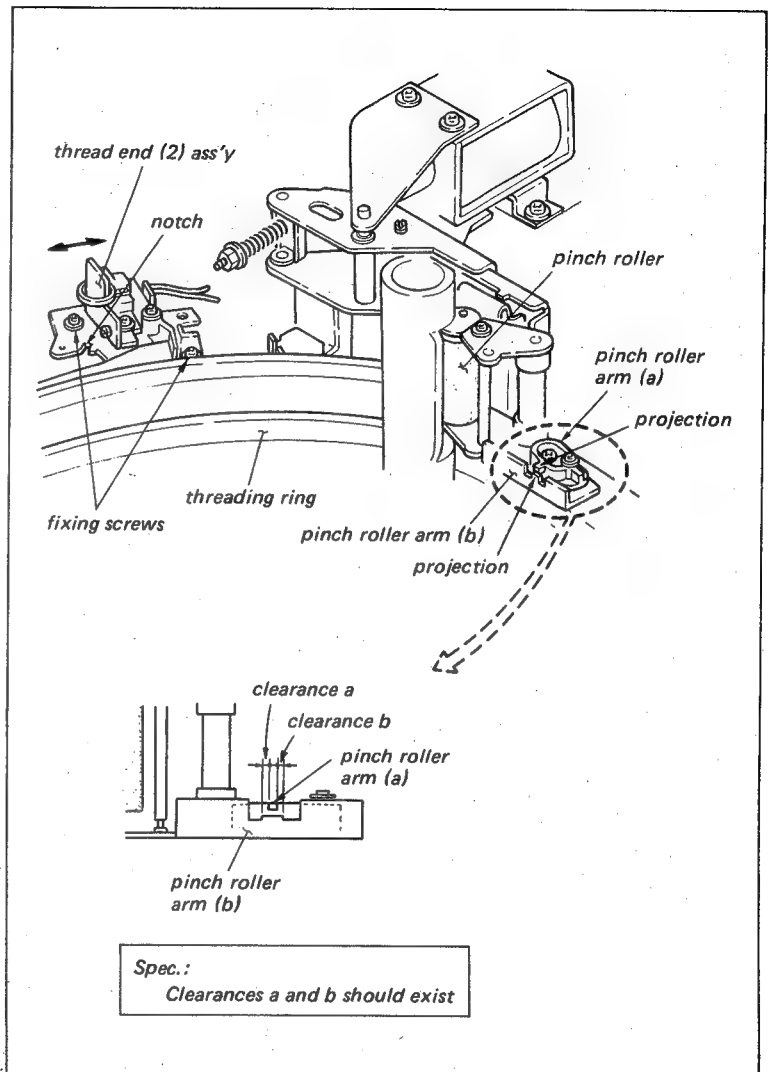
Mode:PLAY

#### Check procedure:

Check that the positional relationship between the pinch roller arm (a) and the pinch roller arm (b) meets the required specification.

#### Adjustment procedure:

- (1) Loosen the fixing screw 1/4 turns of the thread end (2) ass'y.
- (2) Insert a flatblade 3mm screwdriver into the notch, and move the thread end (2) ass'y in the direction shown by arrow to meet the required specification.
- (3) Repeat the PLAY and EJECT modes two or three times, and check the positional relationship meets the required specification.





#### 9-1-4. Pinch Roller Zenith Adjustment

Mode:STOP

##### Check procedure:

Push the pinch lever A portion in the direction of the arrow lightly so that the pinch roller contacts the capstan shaft. Check that the positional relationship between the pinch roller and the capstan shaft meets the required specification.

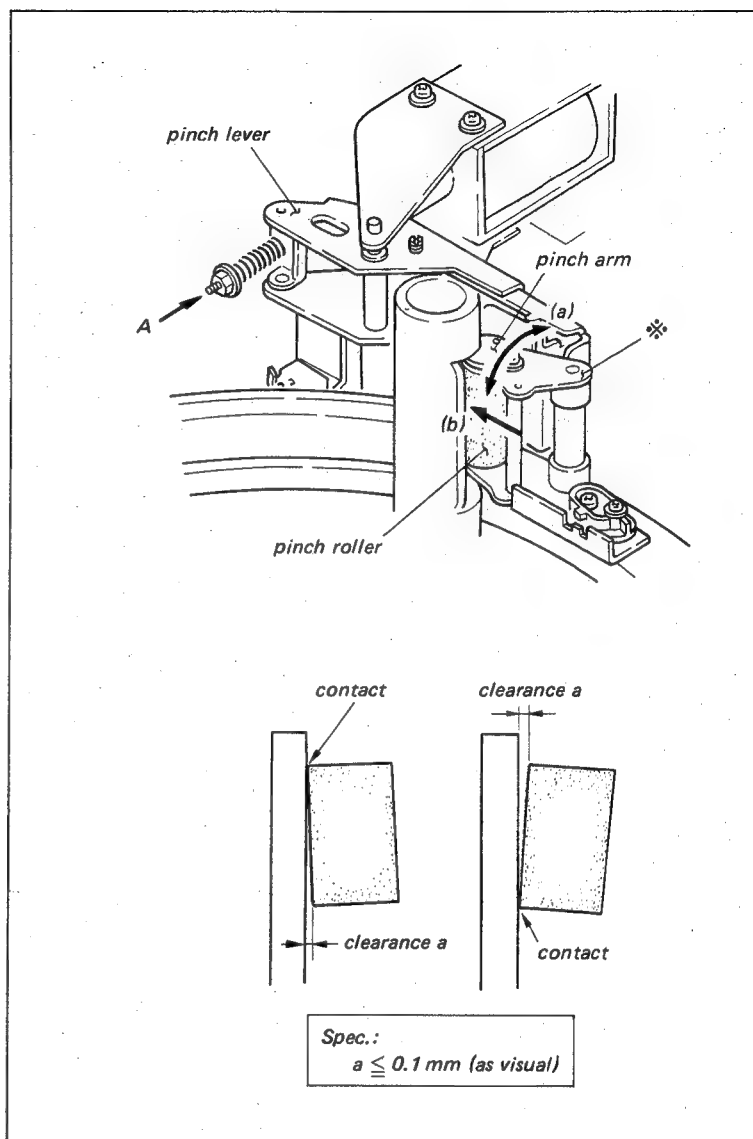
##### Adjustment procedure:

If the clearance is out of spec. at the bottom portion when the top portion is in contact with the capstan shaft.

- (1) Hold the \* marked portion of the pinch arm and bend it in the direction of the arrow (a).

If the clearance is out of spec. at the top portion when the bottom portion is in contact with the capstan shaft.

- (2) Hold the \* marked portion of the pinch arm and bend it in the direction of the arrow (b).



#### 9-1-5. Pinch Roller Azimuth Adjustment

If this adjustment is poor, possible trouble is that a curl of tape at top and bottom flanges of tape guides (3) and (4), threading guides (1),(2) and (3), is resulted during the period of tape threading and tape will get scar.

Mode:PLAY

##### Tool:

Inspection mirror(handle)  
Inspection mirror(mirror)  
Circuit tester  
Sony grease



#### Check procedure:

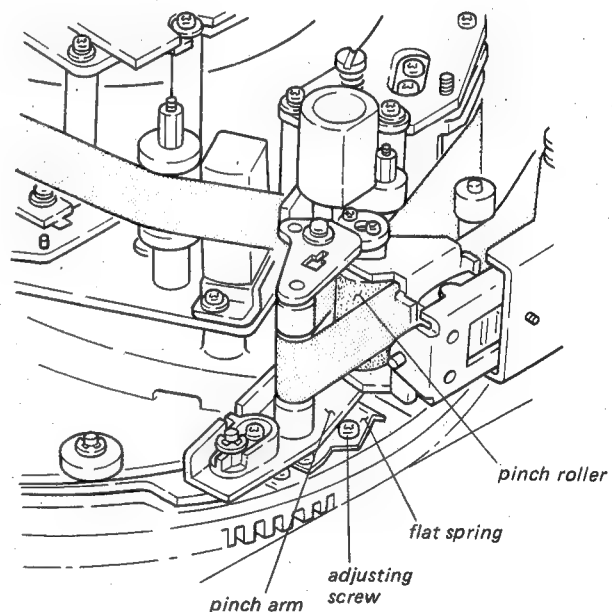
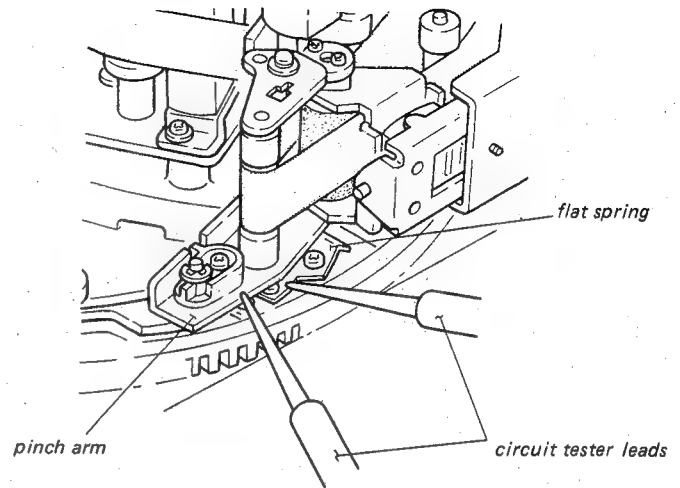
- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment) and put the machine into the threading mode.
- (2) Observe the tape run during the threading at the TG-3, TC-4, threading guides (1), (2) and (3). Check that there exists no tape curl at top and bottom flanges of the tape guides.
- (3) Check to repeat the threading operation two or three times.

#### Adjustment procedure:

- (1) Turn the adjusting screw to the clockwise direction and put not to contact flat spring to the pinch arm.
- (2) Contact the circuit tester leads to flat spring and pinch arm as shown in figure. Turn the adjusting screw to the counterclockwise direction slowly until the flat spring contacts the pinch arm.
- (3) Check the tape curl as check procedure. Fine-adjust the adjusting screw so that the curl does not exist.
- (4) Put the machine into EJECT completion mode. Push the pinch arm toward the drum ass'y lightly with a finger, and smear sony grease a little onto the projection of the flat spring.

#### (CAUTION)

Take care not to smear sony grease onto the pinch roller and the guides.





### 9-1-6. Pinch Roller Preset Adjustment

**Mode:** STOP

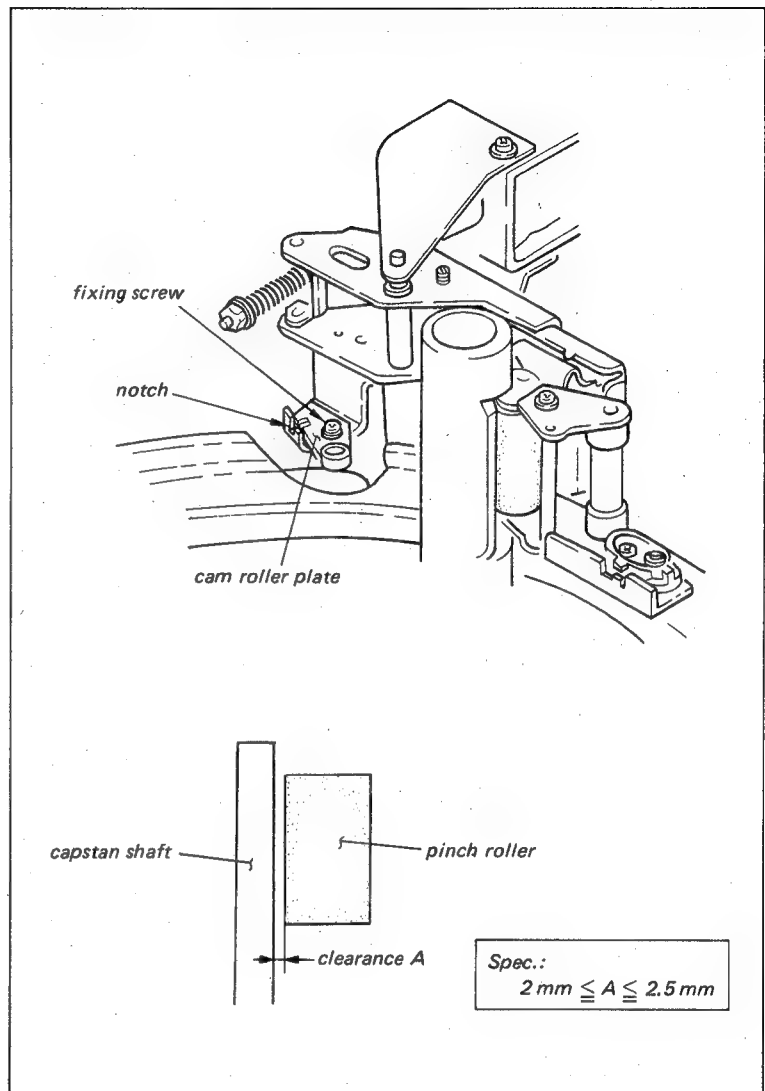
**Tool:** Thickness gauge

**Check procedure:**

Check that the clearance between the capstan shaft and the pinch roller meets the required specification.

**Adjustment procedure:**

- (1) Loosen the fixing screw of the cam roller plate about 1/4 turns.
- (2) Insert a flatbrade 3 mm screwdriver into the notch of the cam roller plate, and adjust the position meets the required specification
- (3) Repeat the EJECT and STOP modes two or three times and check clearance.





## 9-2. FWD/REV TAPE RUN ADJUSTMENT

### 9-2-1. Tape Run Adjustment at Threading Guide (1)

Mode:PLAY/STOP

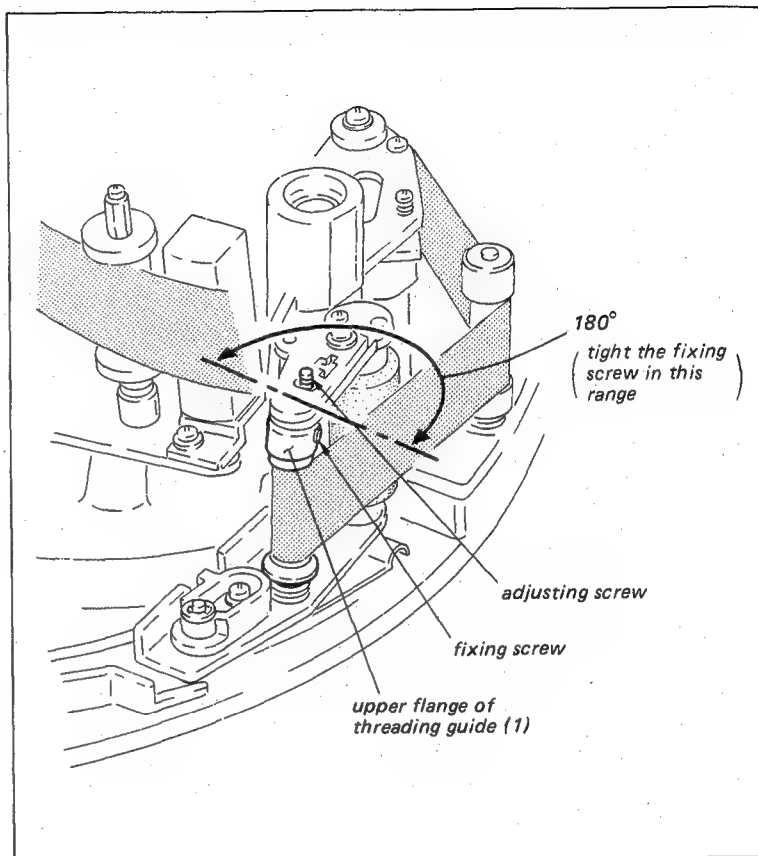
Tool:Allen wrench (each edge has 0.9mm/1.27mm)

#### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment). Put the machine into the FWD mode(xl). Check that the tape top edge runs in contact with the upper flange of the threading guide (1) without curl.
- (2) Put the machine into the STOP mode. Check that the tape top edge contacts the upper flange of the threading guide (1) without curl.

#### Adjustment procedure:

- (1) Loosen the fixing screw of the flange and adjust to meet the required specification with adjusting screw in the PLAY mode.
- (2) Tighten the fixing screw of upper flange within the range as shown in figure.





## 9-2-2. Tape Wrinkle Release Adjustment at Pinch Roller

**Mode:**FWD(x1/30) to FWD(x5)  
REV(x1/30) to REV(x5)

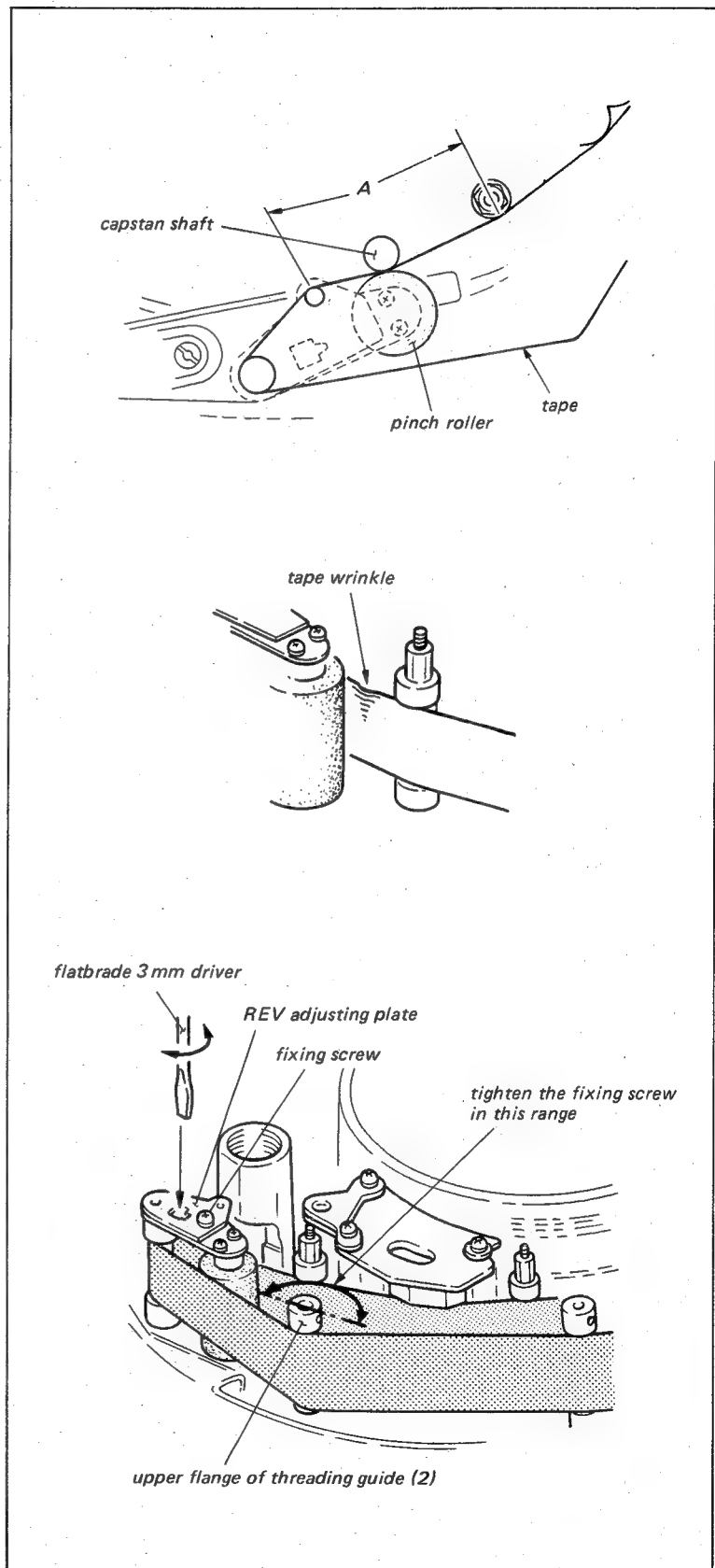
**Tool:**Allen wrench (each edge has 1.27mm)

### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment). Put the machine into the REV mode(x1). Observe the surface of the running tape very carefully in the A section as shown in figure. Check that amount of tape tension at the two points is exactly equal i.e., equal at the tape top and tape bottom. The tape wrinkle should be as shown in figure.
- (2) Repeat the FWD(x1/30) to (x5) and the REV(x1/30) to (x5) operation. Observe the surface of the running tape very carefully in the A section as shown in figure. Check that amount of tape tension is exactly equal.
- (3) Put the KCA-60 cassette tape at the tape beginning portion. Put the machine into the FWD(x1) and REV(x1) mode. Check that the tape wrinkle, that is given in the moment of the pinch roller's pressing against the capstan, does disappear within 1.5 second.
- (4) Put the machine into the FWD(x5) and REV(x5) modes. If a scar does not mark, though tape wrinkles does disappear in a moment, it is acceptable.
- (5) Put the tape at the tape end portion. Check that the tape wrinkle as the same manner in steps (3) and (4).

### Adjustment procedure:

- (1) Fine-adjust the position of upper flange of threading guide (2) to satisfies the specification.





**(CAUTION)**

Tighten the fixing screw of upper flange within the range as shown in figure.

- (2) If the tape tension at the two points does not turn into the exactly equal by step (1), loosen the fixing screw 1/2 to 1/4 turns of REV adjusting plate and insert a flatbrade 3mm screwdriver into the hole, and turn the screwdriver in the direction shown by arrow until the tape tension at the two points is exactly equal.

**9-2-3. Tape Run Adjustment at Correction Guide (A)**

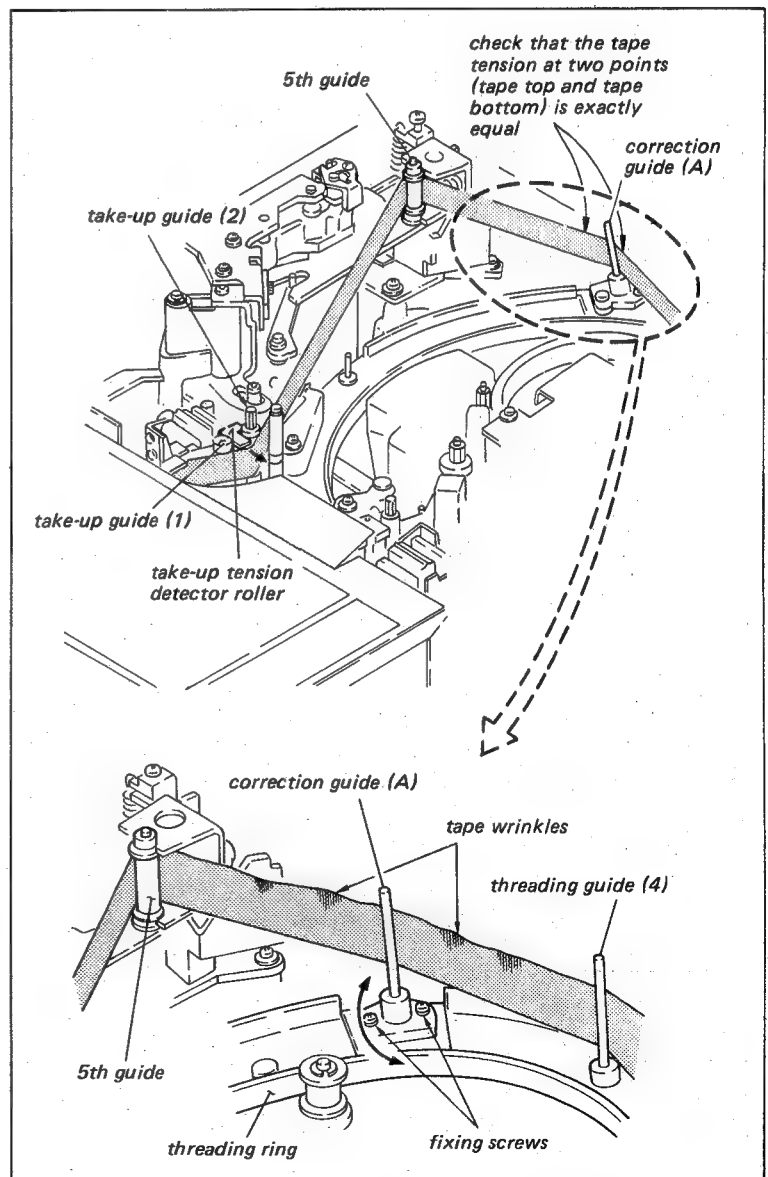
**Mode:**FWD(X1), REV(x1)

**Check procedure:**

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment) and put the machine into the FWD mode(x1).
- (2) Observe the surface of the running tape very carefully in the position as shown in figure. Check that amount of tape tension at the two points is exactly equal i.e., equal at the tape top and tape bottom.
- (3) Put the machine into the REV mode(x1). Check that the tape tension as the same manner in step (2).
- (4) Put the machine into the FWD mode(x1). Press the T-tension detector roller lightly in the direction of the arrow with finger. Check that the tape runs without curl at the top and bottom flanges of 5th guide.

**Adjustment procedure:**

Loosen the fixing screw of correction guide (A) 1/2 turns and move the guide in the direction of the arrow to meet the required specification in all modes.





#### 9-2-4. Tape Run Adjustment at 6th Guide

Mode:FWD(x1), REV(x1)

##### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment). Put the machine into the FWD mode(x1).
- (2) Check that the tape runs without curl at the top and bottom flanges of the 6th guide, take-up guide (1) and (2).
- (3) Check the tape run same as the above in the REV(x1) mode.
- (4) Put the machine into the FWD (x1) mode. Push the T tension detector roller lightly in the direction of the arrow with finger. Check that the tape running without curl at the top and bottom flanges of take-up guide (1) and (2).

##### Adjustment procedure:

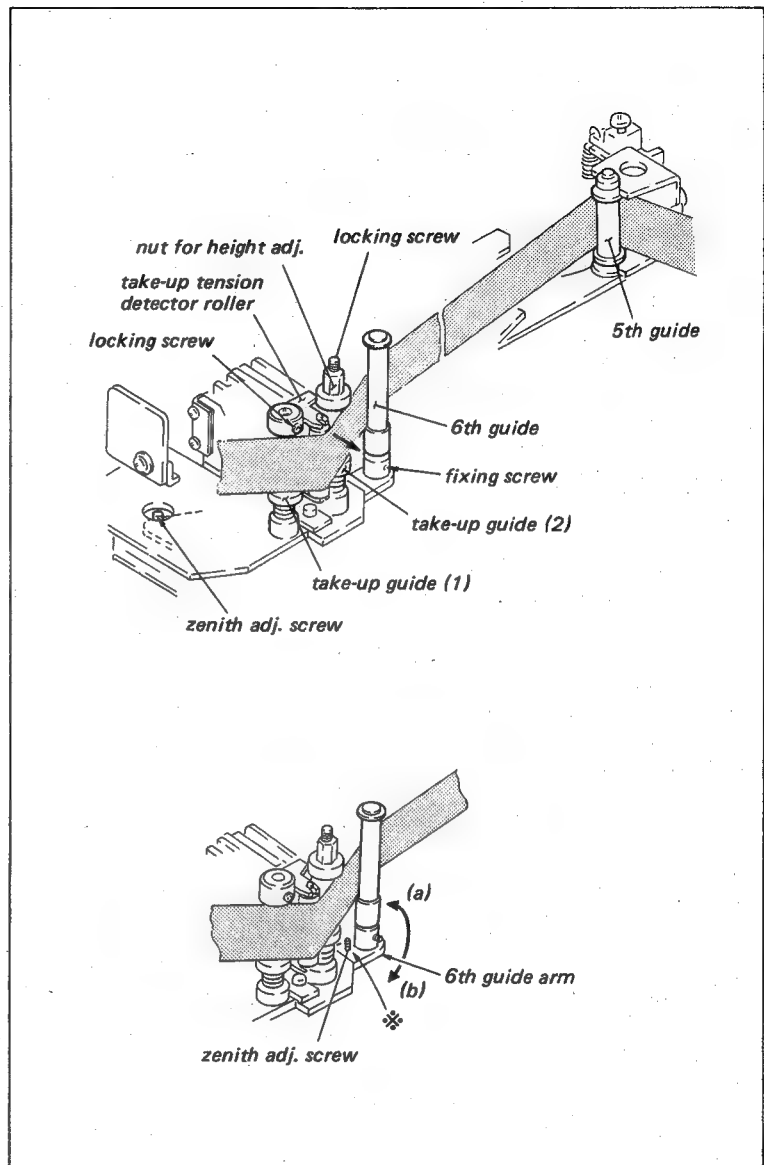
If there exists tape curl in the procedures (2) and (3).

- (1) If there exists tape curl at the 6th guide, loosen the fixing screw and adjust the height.  
If there exists tape curl at the take-up guide (1) and (2), loosen the locking screw of take-up guide (2). Turn the adjusting nut and adjust the height.

If there exists tape curl in the procedure (4).

- (2) If there exists tape curl at the top and bottom flanges of take-up guides (1) and (2), turn the 6th guide zenith adj. screw in the clockwise direction.

If there exists tape curl at the bottom flange, tune the adj. screw in the counter-clockwise direction.





Do not rotate the zenith adj. screw more than one full turn (360 degrees) in either direction of the clockwise or counterclockwise.

- (3) If the adjusting is not satisfied in step (2), adjust as follows.

Turn the zenith adj. screw of 6th guide.

#### 9-2-5. Tape Run Adjustment at S Guide (1) and (2)

##### Tool:

Alignment tape, RR5-2SB-PAL  
Oscilloscope  
Extension board

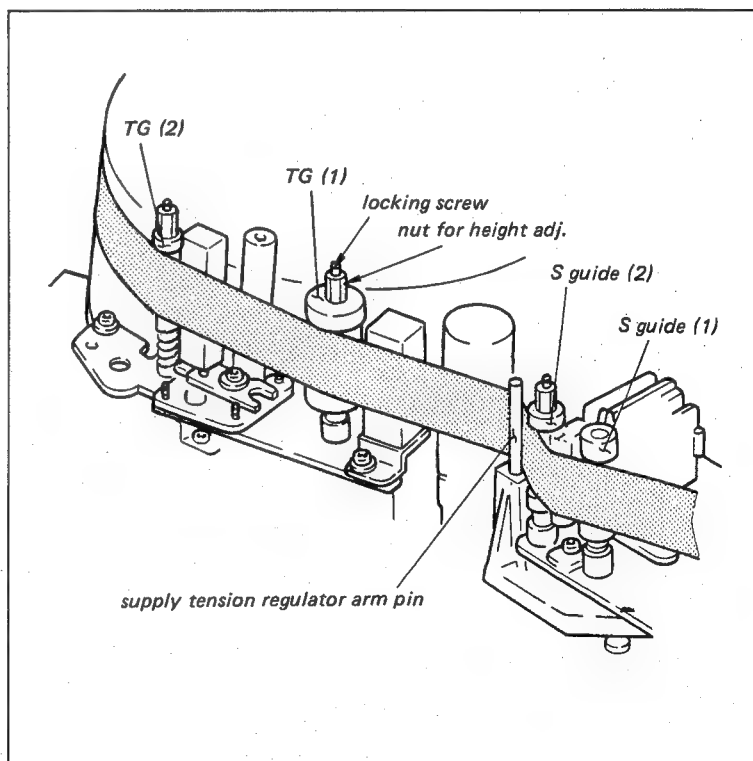
Mode:FWD(x1), REV(x1)

##### Check procedure:

- (1) Insert a KCA-60 cassette tape (use the middle portion of the tape for this adjustment) and put the machine into the FWD(x1) mode.
- (2) Check that there are not curl at tape guides (1), (2), TG1 and TG2.
- (3) Check that amount of tape tension at the two points is exactly equal i.e., equal at the tape top and tape bottom at the supply tension regulator.

##### Adjustment procedure:

- (1) Connect the oscilloscope to TP6/YD-14 board and externally trigger from TP3/YD-14 board.
- (2) Play back the color-bar portion or the monoscope portion of the alignment tape.





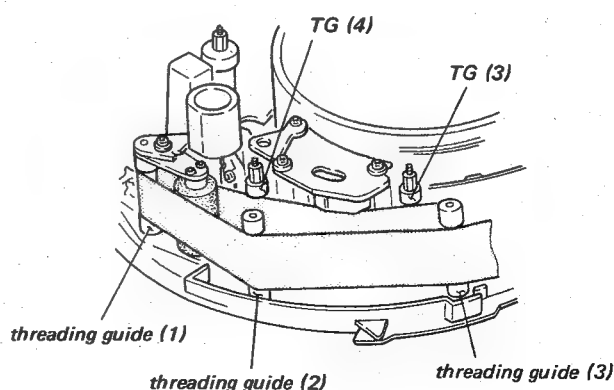
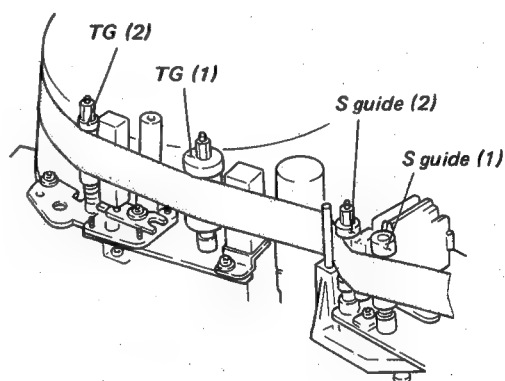
- (3) Adjust height of the guides so that the RF envelope fluctuation maintains flatness and the tape run without curl of supply guide (1), (2), TG1 and TG2. Adjust height so that amount of tape tension at the supply tension regulator is exactly equal i.e., equal at the tape top and tape bottom. Do not adjust the slantness of supply tension regulator arm pin.

### 9-2-6. FWD/REV Tape Run Overall Adjustment

Mode:FWD(x1), REV(x1)

#### Check procedure:

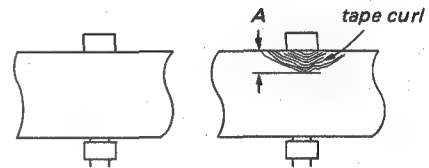
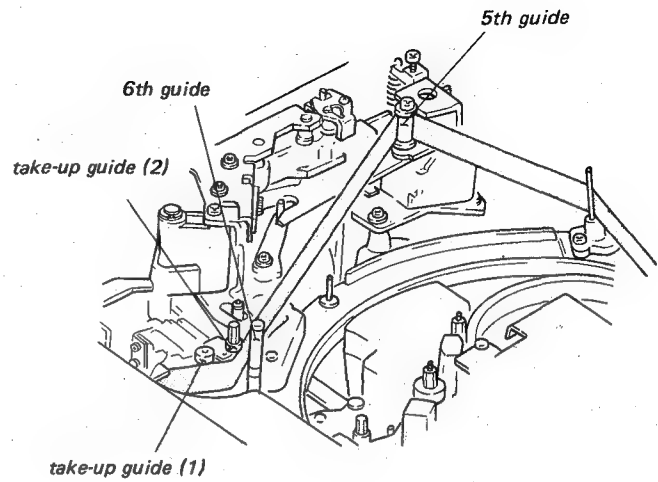
- (1) Insert a KCA-60 cassette tape. Repeat putting the machine into the FWD (x1) and the REV-(x1) modes. Check as follows.
- (2) Check that there is not curl of supply guide (1), (2), TG1 and TG2. Tape curl, if it exists in the FWD(x1) or the REV(x1) modes, check that the tape curl meets the specification. Observe the surface of the running tape very carefully in the supply tension regulator. Check that amount of tape tension at the tape top and tape bottom is exactly equal amount.
- (3) Check that there exists no tape curl of TG3, TG4 and threading guide (2). Tape curl, if it exists in the FWD(x1) or the REV(x1) modes, check that curl meets the specification. Check that there exists no tape curl at threading guide (1).
- (4) Check that there exists no tape curl at 5th guide. Tape curl, if it exists in the FWD(x1) or the REV(x1) mode, check that curl meets the required specification. Check that there exists no tape curl at take-up guide (1), (2) and 6th guide.





**Adjustment procedure:**

If tape curl does not meet the required specification, perform the sec.9-2 FWD/REV Tape Run Adjustment.



**Spec.:**

There exists no tape curl in REV and FWD modes.  
If there exists tape curl, the tape curl in either  
FWD or REV mode is acceptable.

Acceptable tape curl is  $A \leq \frac{\text{tape width}}{4}$



### 9-2-7. S Tension Regulator Arm Pin Slantness Adjustment

This adjustment is usually not required. Proceed the following steps only when the supply tension regulator arm block is replaced or removed.

**Tool:** Flatness plate

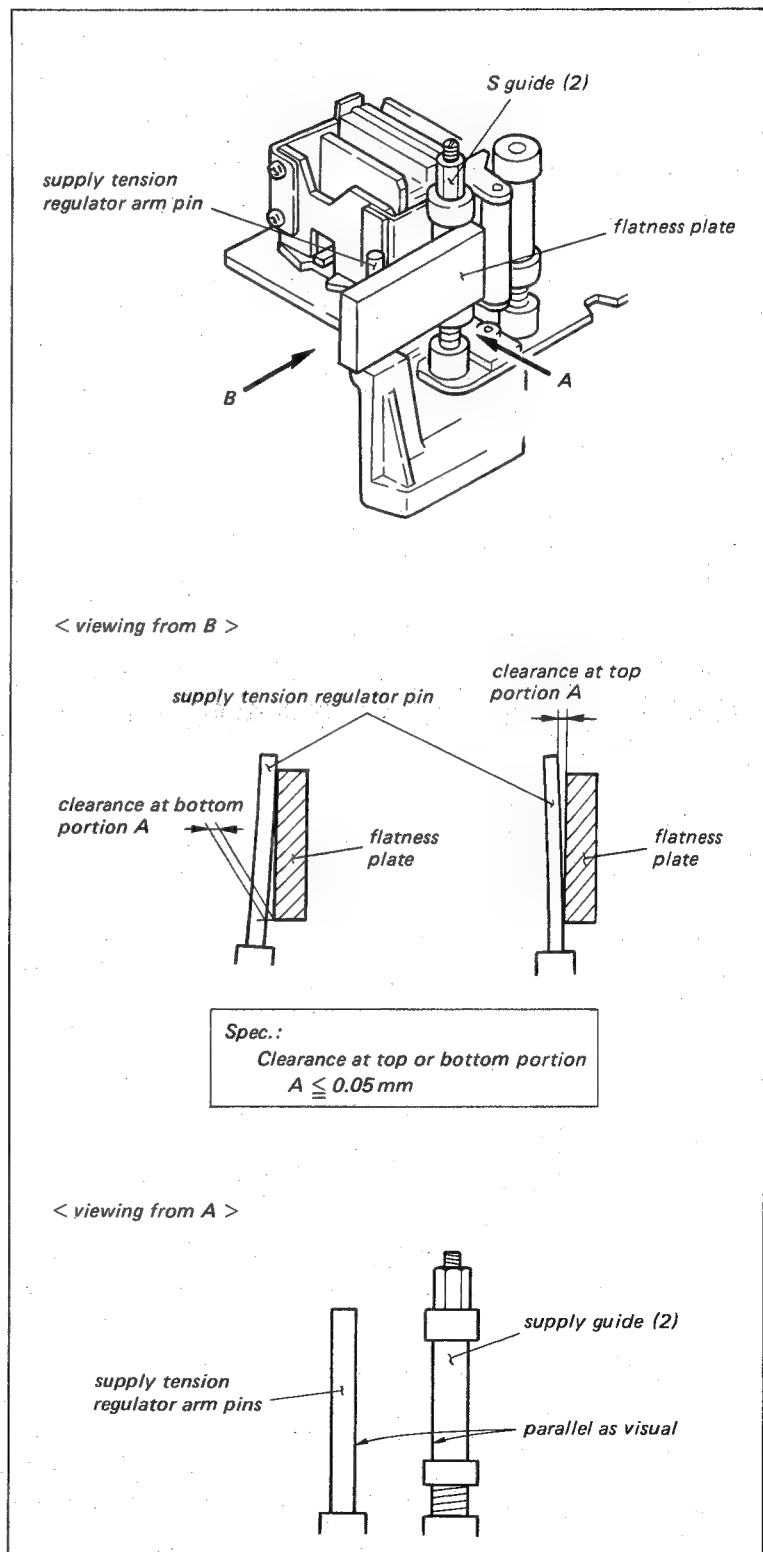
**Mode:** STANDBY

#### Check procedure:

- (1) Set the flatness plate on the supply guide (2) as shown in figure. Press the flatness plate with the S tension regulator pin lightly. Check that the clearance between S tension regulator pin and flatness plate meets the required specification.
- (2) Check that the clearances of the top and bottom between the S tension regulator pin and the supply guide (2) are equal viewing from the direction of the arrow A.

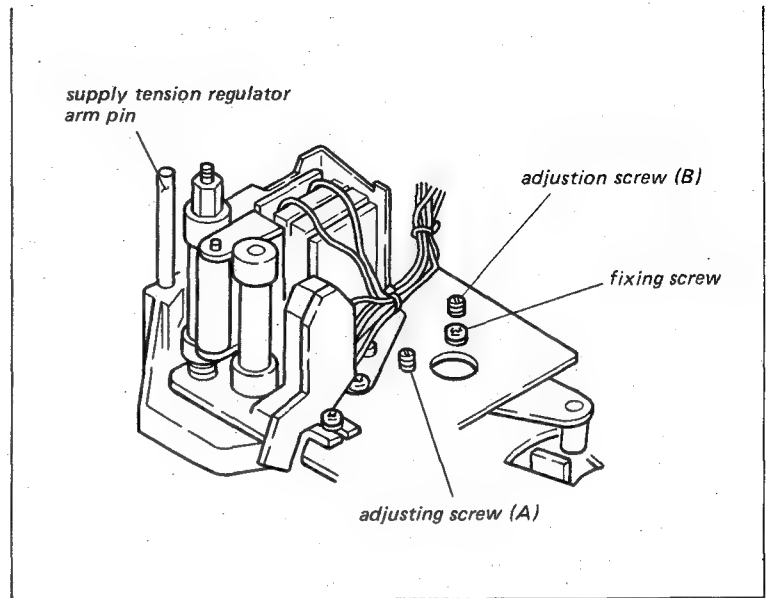
#### Adjustment procedure:

- (1) If the check procedure (1) is out of specification.  
When the clearance is out of spec. at the top portion, loosen the fixing screw about 1/2 turns and turn the adjusting screw A and B of exactly equal amount in clockwise direction. Tighten the fixing screw and check again.  
When the clearance is out of spec. at the bottom portion, turn the adjusting screws A and B of exactly equal amount in counterclockwise direction. Tighten the fixing screw and check again.
- (2) If the check procedure (2) is out of specification.  
When the clearance is out of spec. at the top portion, loosen the fixing screw about 1/2 turns and turn the adjusting screw A and B of exactly equal amount in clockwise direction. Tighten the fixing screw and check again.





When the clearance is out of spec. at the bottom portion, turn the adjusting screws A and B of exactly equal amount in counterclockwise direction. Tighten the fixing screw and check again.





### 9-3. VIDEO TRACKING ADJUSTMENT

#### Tool:

Alignment tape, RR5-2SB-PAL  
Flatness plate  
Extension board  
Oscilloscope

#### Preparation:

- (1) Turn off the power.
- (2) Remove the YD-14 board from the Amp chassis and insert the extension board into this position.
- (3) Insert the YD-14 board into the end of the extension board.
- (4) Connect the oscilloscope to TP6/YD-14 board, and externally trigger from TP3/YD-14 board.
- (5) Turn on the power.
- (6) Playback the color-bar or monoscope portion of the alignment tape.
- (7) Set the DT SELECT switch to the OFF position.

#### Check procedure:

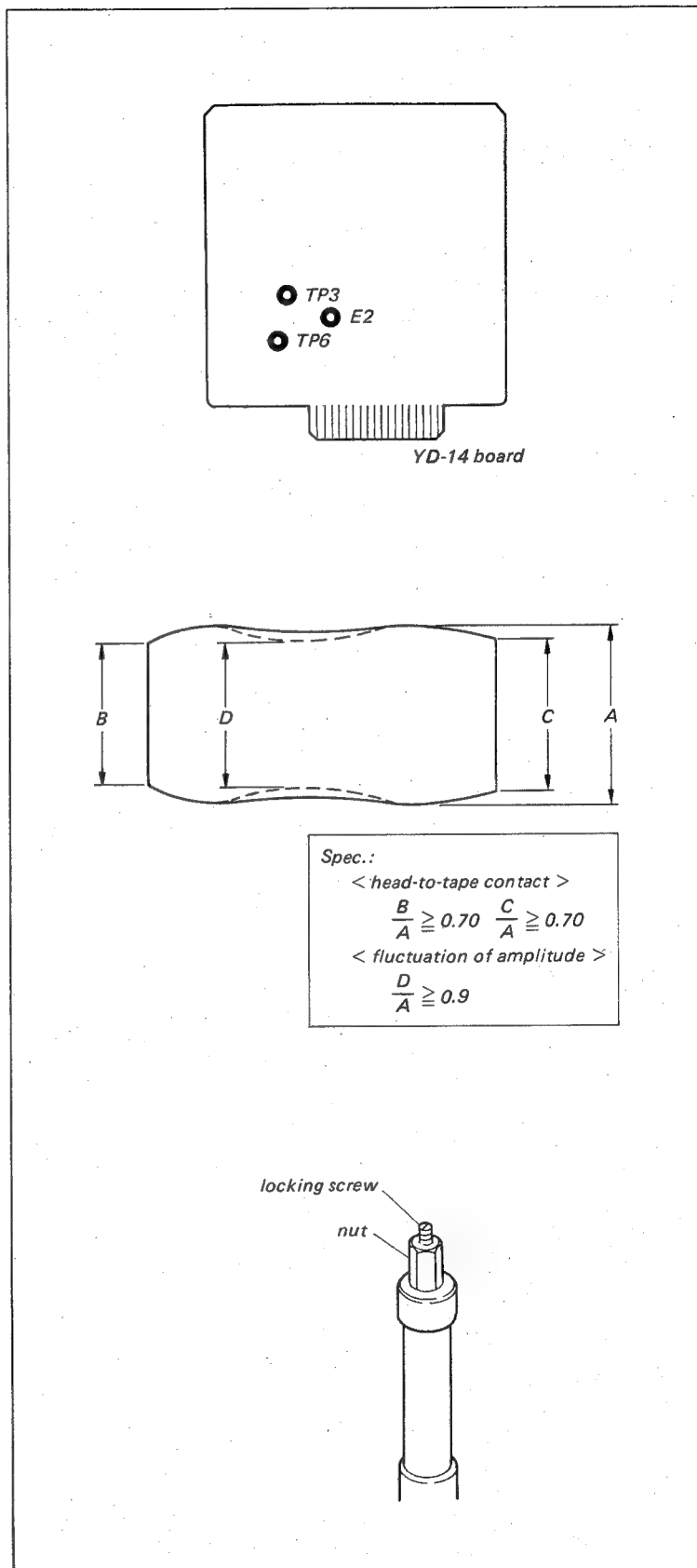
- (1) While observing the waveform on the scope, turn the TRACKING control knob in the both directions noting that the RF waveform maintains a flat envelope while the amplitude increases and decreases.
- (2) Confirm that the RF waveform fluctuation and head-to-tape contact are within the specification when the RF envelope is made as large as possible by turning the TRACKING control knob.

#### Adjustment procedure:

When perform the tape guide height adjustment, loosen the locking screw of tape guides.

When the tracking at the drum's input side is no good.

- (1) Set the TRACKING control knob so that the RF waveform amplitude is made to 70 to 80 % of the maximum amplitude.



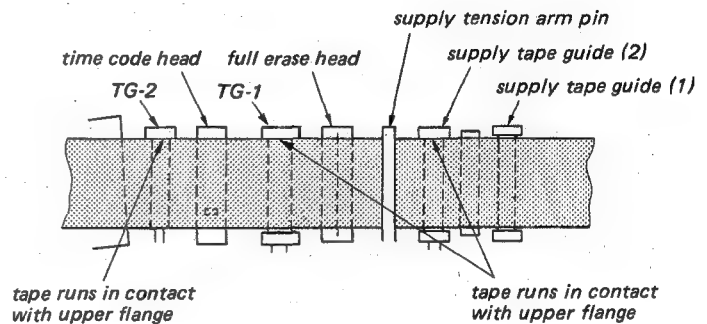
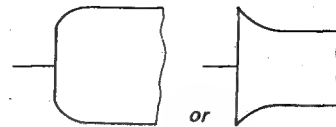


- (2) Adjust height of the tape guides of TG-1, TG-2 and supply tape guide 2. Do not adjust the slantness of the supply tension regulator arm.

When the tracking at the drum's exit side is no good.

- (3) Set the TRACKING control knob so that the RF waveform amplitude is made to 70 to 80 % of the maximum amplitude.
- (4) When the RF waveform is not flat as shown in Fig.1, adjust the height of TG-3 and TG-4 so that the RF waveform is flat. When the RF waveform is no flat as shown in Fig.2, adjust the height of TG-3 and TG-4 so that the RF waveform is flat. If it does not with this adjustment, adjust the zenith of the audio/CTL head within the allowable range. Adjust the height of the TG-3 and TG-4.

< drum entrance side >



< drum exit side >

Fig. 1

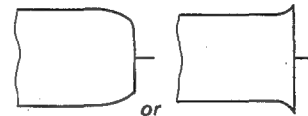
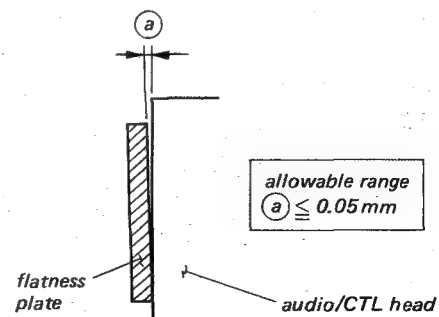
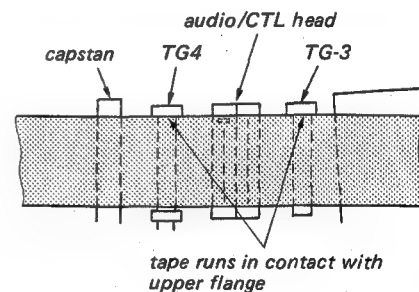
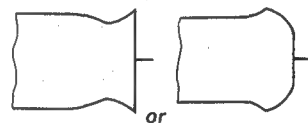


Fig. 2





#### 9-4. ERASE HEAD ZENITH ADJUSTMENT

**Tool:** Flatness plate

**Check procedure:**

Check that the clearance between the erase head and the flatness plate meets the required specification, when the flatness plate is set on the erase head and TG1.

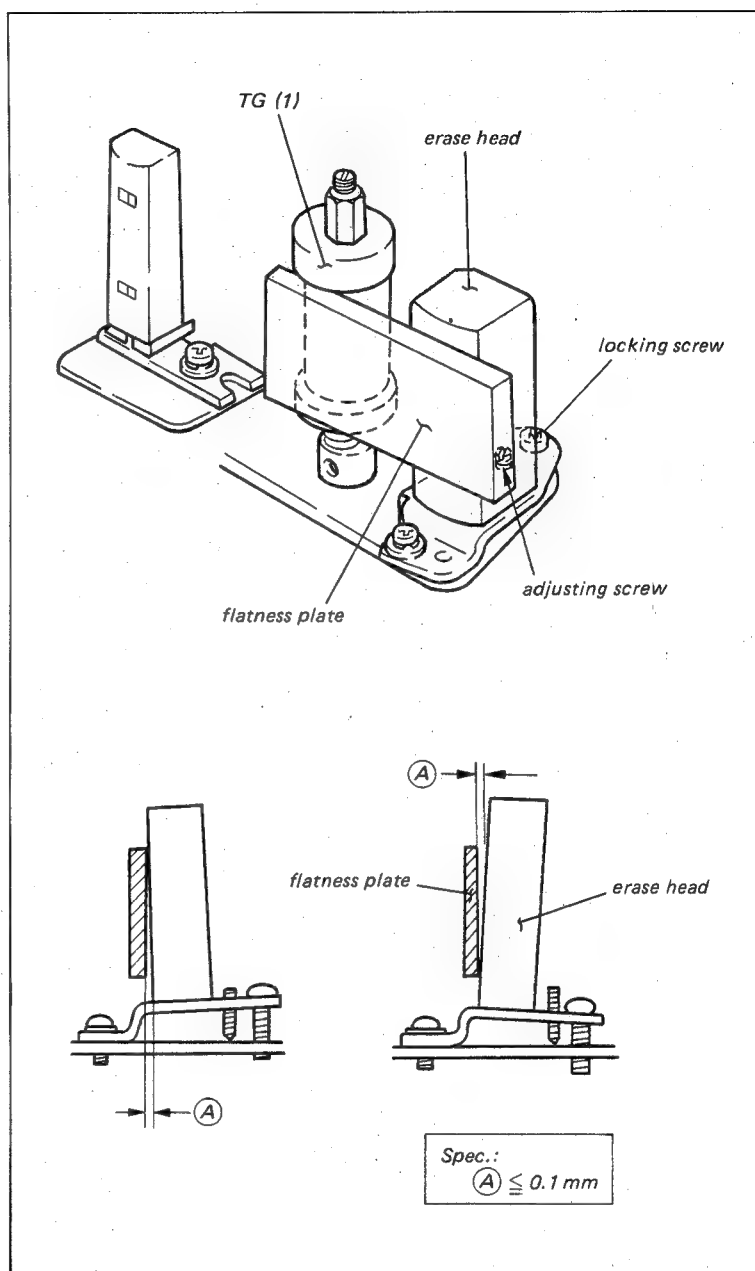
**Adjustment procedure:**

When the clearance is out of spec. at the top portion of the erase head.

- (1) Turn the adjusting screw in counterclockwise direction.
- (2) Tighten the locking screw and check zenith again.

When the clearance is out of spec. at the bottom portion of the erase head.

- (3) Loosen the locking screw.
- (4) Turn the adjusting screw in clockwise direction.
- (5) Tighten the locking screw and check zenith again.





## 9-5. TIME CODE HEAD ADJUSTMENT

### 9-5-1. Time Code Head Tape-to-Head Contact Adjustment

#### Tool:

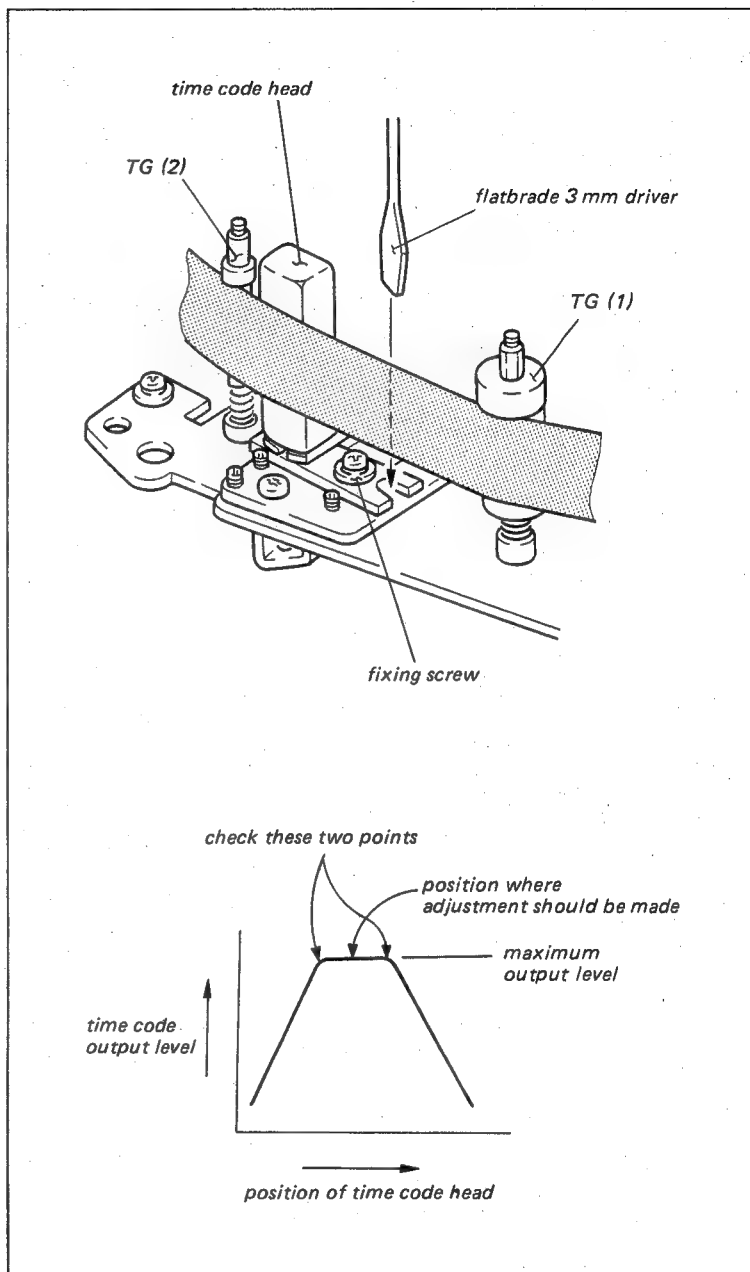
Alignment tape, RR5-2SB-PAL  
VTVM or oscilloscope

#### Preparation:

- (1) Connect the VTVM or oscilloscope to TIME CODE OUT terminal.
- (2) Playback the color-bar portion of the alignment tape. (time code output level is about -30 dB.)

#### Adjustment procedure:

- (1) Loosen the fixing screw of time code head about 1/4 turns.
- (2) Insert a flatbrade 3mm screwdriver into the hole as shown in figure. Adjust the time code head block where the output is maximum and starting to decrease.
- (3) Set the time code head block on the middle portion of two points and tighten the fixing screw.





## 9-5-2. Time Code Head Height Adjustment

### Tool:

Alignment tape, RR5-2SB-PAL  
VTVM or Oscilloscope

### Preparation:

- (1) Connect the VTVM or oscilloscope to TIME CODE OUT terminal.
- (2) Playback the color-bar portion of the alignment tape.

### Check procedure:

Check that the level increase is less than 0.5 dB when pressing down at A and pushing up B.

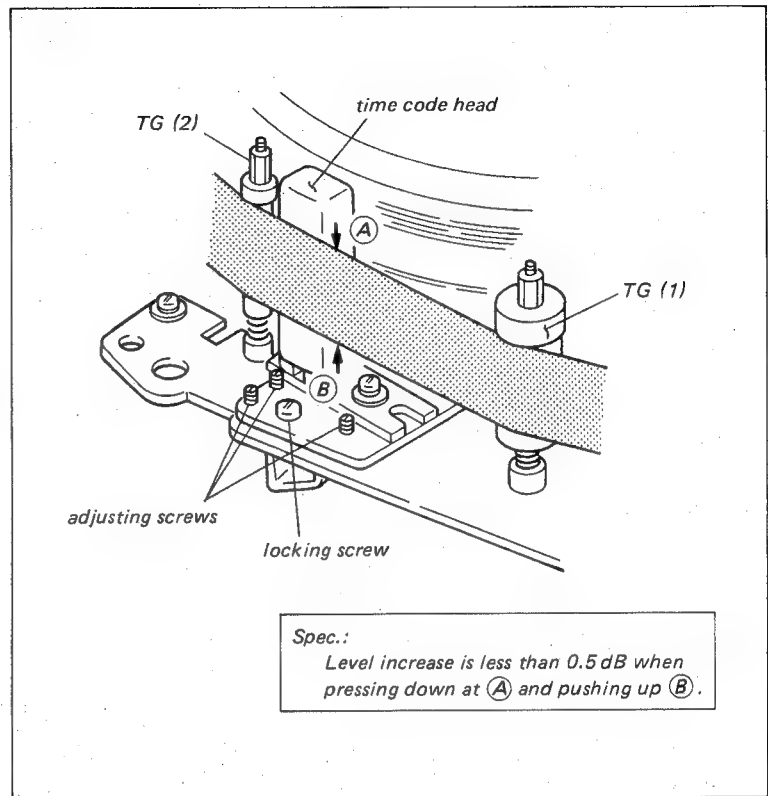
### Adjustment procedure:

Level increase is more than 0.5 dB when pressing down at A.

- (1) Loosen the locking screw 1/2 to 1/4 turns and turn 3 adjusting screws of exactly equal amount in clockwise direction.
- (2) Tighten the locking screw and check height again.

Level increase is more than 0.5 dB when pushing up at B.

- (3) Turn 3 adjusting screws of exactly equal amount in counter-clockwise direction.
- (4) Tighten the locking screw and check height again.





### 9-5-3. Time Code Head Zenith Adjustment

**Tool:** Flatness plate

#### **Check procedure:**

Check that the clearance between the time code head and the flatness plate meets the required specification, when the flatness plate is set on the time code head and TG-2.

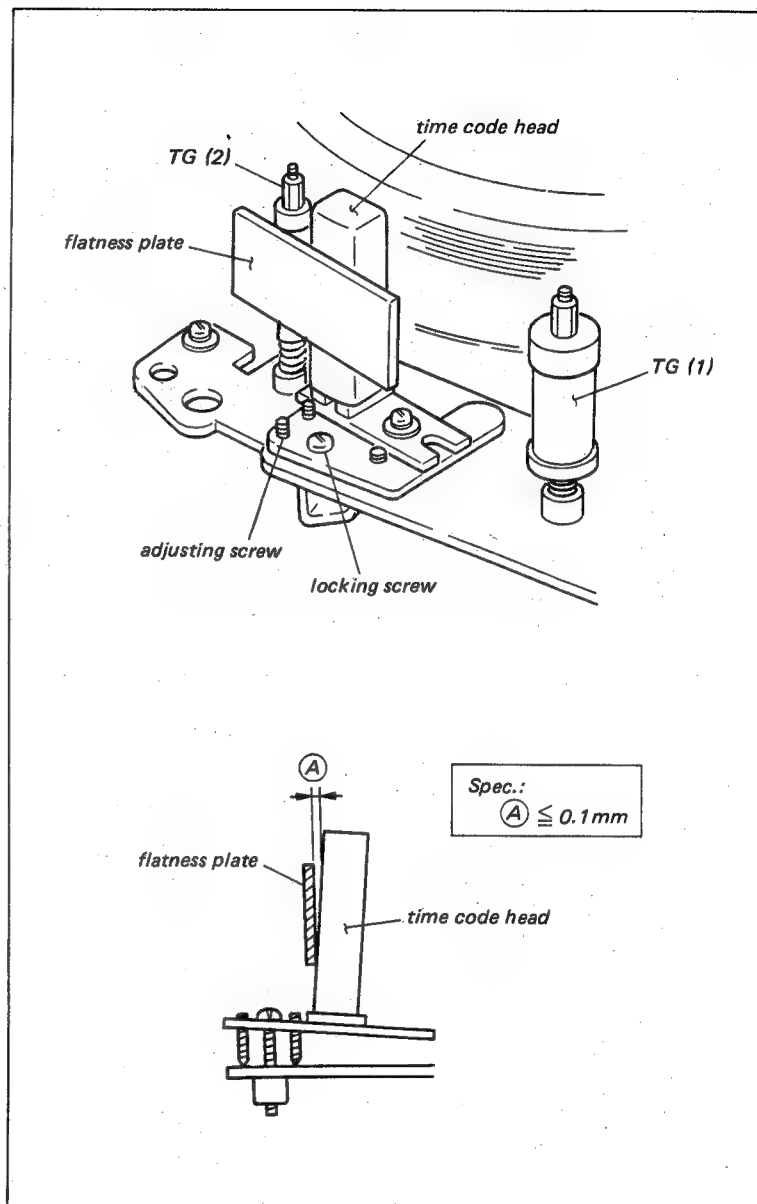
#### **Adjustment procedure:**

When the clearance is out of spec. at the top portion of the time code head.

- (1) Turn the adjusting screw in counterclockwise direction.
- (2) Tighten the locking screw and check zenith again.

When the clearance is out of spec. at the bottom portion of the time code head.

- (3) Loosen the locking screw 1/4 to 1/2 turns and turn the adjusting screw in clockwise direction.
- (4) Tighten the locking screw and check zenith again.





## 9-6. AUDIO HEAD ADJUSTMENT

### 9-6-1. Audio Head Height Adjustment

#### Tool:

Alignment tape, RR5-2SB-PAL  
VTVM or Oscilloscope

#### Preparation:

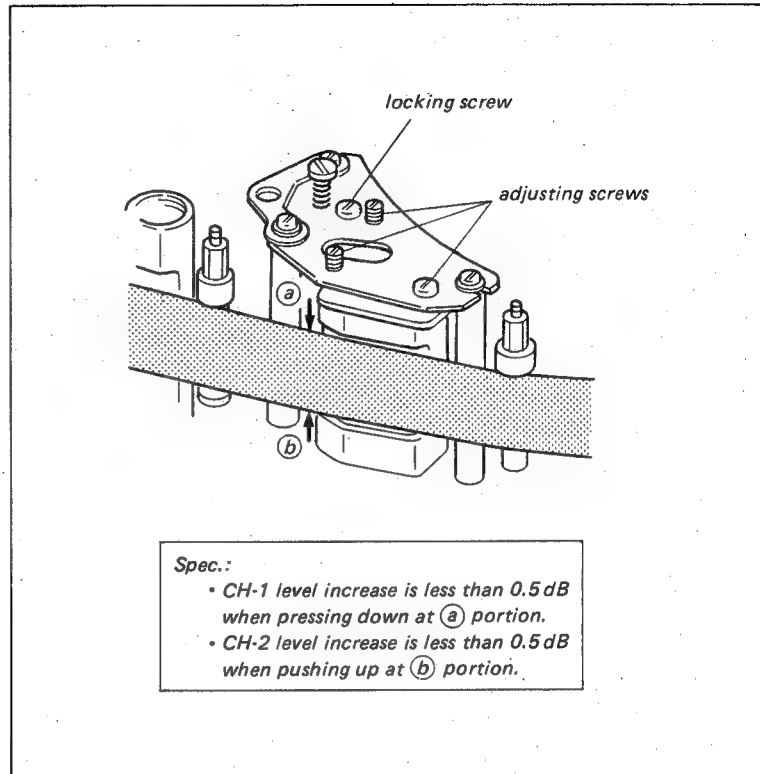
- (1) Connect the VTVM or oscilloscope to AUDIO OUT CH-1 and CH-2 terminals.
- (2) Playback the audio 1 kHz portion of the alignment tape.

#### Check procedure:

- (1) Check that the CH-1 output level increase is less than 0.5 dB when pressing down at A. If not, perform the steps (1) and (2) of the adjustment procedure.
- (2) Check that the CH-2 output level increase is less than 0.5 dB when pushing up at B. If not, perform the steps (3) and (4) of the adjustment procedure.

#### Adjustment procedure:

- (1) Loosen the locking screw and turn the zenith height adjusting screws (R) and (F) counterclockwise at the same amount and turn the azimuth adjusting screw clockwise at the same amount.
- (2) Tighten the locking screw and check height again.
- (3) Loosen the locking screw and turn the zenith height adjusting screws (R) and (F) clockwise at the same amount and turn the azimuth adjusting screw counterclockwise at the same amount.
- (4) Tighten the locking screw and check height again.





## 9-6-2. Audio Head Zenith Adjustment

Tool: Flatness plate

### Check procedure:

Check that the clearance between the audio head and the flatness plate meets the required specification, when the flatness plate is set on the audio head and TG-3. Do not set the flatness plate on the upper portion of the TG-3.

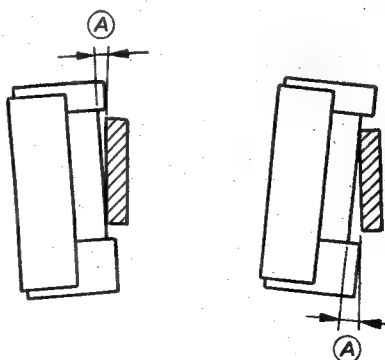
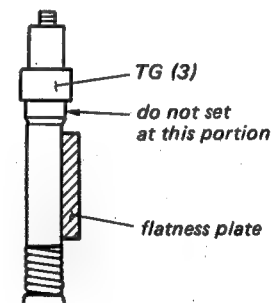
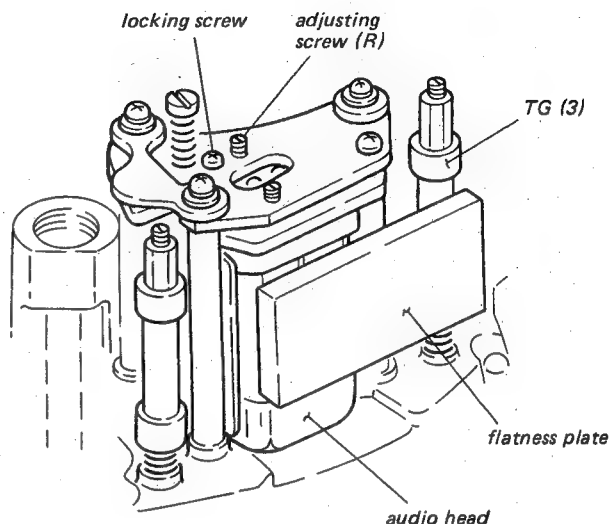
### Adjustment procedure:

.When the clearance is out of spec. at the top portion of the audio head.

- (1) Turn the adjusting screw (R) in counterclockwise direction.
- (2) Tighten the locking screw and check zenith again.

.When the clearance is out of spec. at the bottom portion of the audio head.

- (3) Loosen the locking screw 1/4 to 1/2 turns and turn the adjusting screw (R) in clockwise direction.
- (4) Tighten the locking screw and check zenith again.



Spec.:  
(A)  $\leq 0.05 \text{ mm}$



### 9-6-3. Audio Head Azimuth Adjustment

#### Tool:

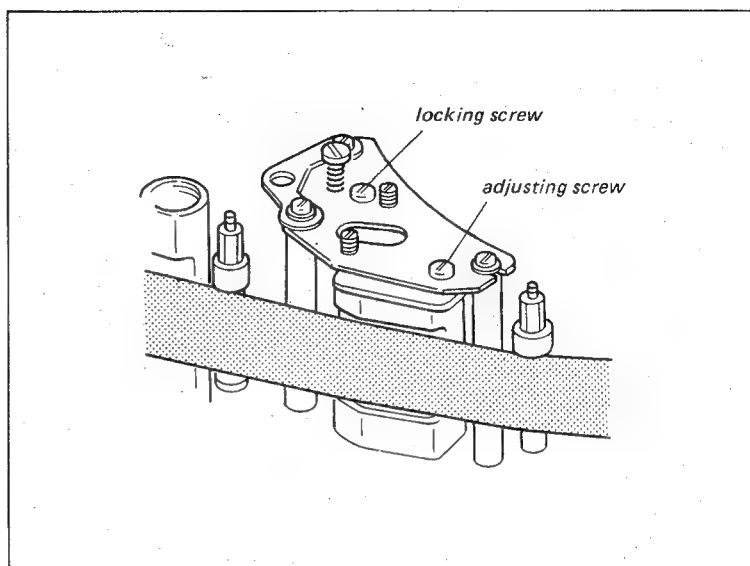
Alignment tape, RR5-2SB-PAL  
VTVM or oscilloscope

#### Preparation:

- (1) Connect the VTVM or oscilloscope to AUDIO OUT CH-1 or CH-2 terminal.
- (2) Playback the audio 10 kHz portion of the alignment tape.

#### Adjustment procedure:

- (1) Loosen the locking screw and adjust the maximum output level by turning the adjusting screw.
- (2) Tighten the locking screw.



### 9-6-4. Audio Head Phase Adjustment

#### Tool:

Alignment tape, RR5-2SB-PAL  
Oscilloscope

#### Preparation:

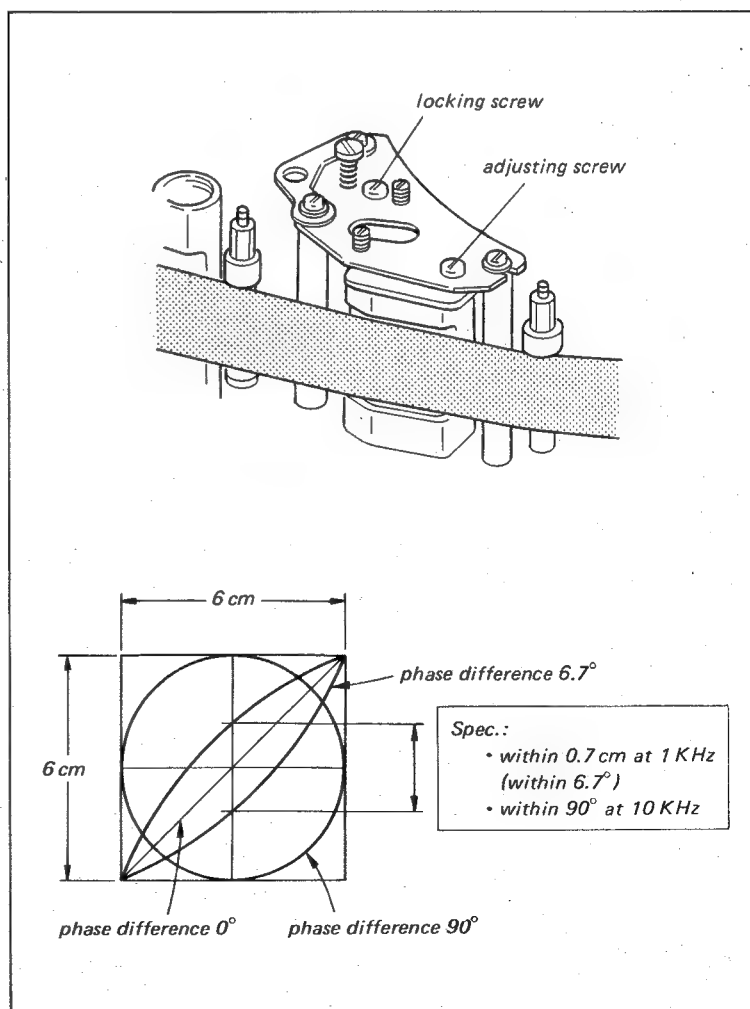
- (1) Connect the horizontal and vertical terminals of the oscilloscope to AUDIO OUT CH-1 and CH-2 terminals.
- (2) Playback the audio 1 kHz portion of the alignment tape.
- (3) Adjust the scope for horizontal and vertical amplitudes of 6 cm of a lissajous waveshape.

#### Check procedure:

Check that the vertical amplitude at the center in the horizontal direction is within the specification at 1 kHz and 10 kHz.

#### Adjustment procedure:

- (1) Loosen the locking screw 1/4 to 1/2 turns and adjust the phase by turning the adjusting screw.
- (2) Tighten the locking screw and confirm phase again.





## 9-7. AUDIO/CTL HEAD POSITION ADJUSTMENT

### Tool:

Alignment tape, RR5-2SB-PAL

Oscilloscope

### Preparation:

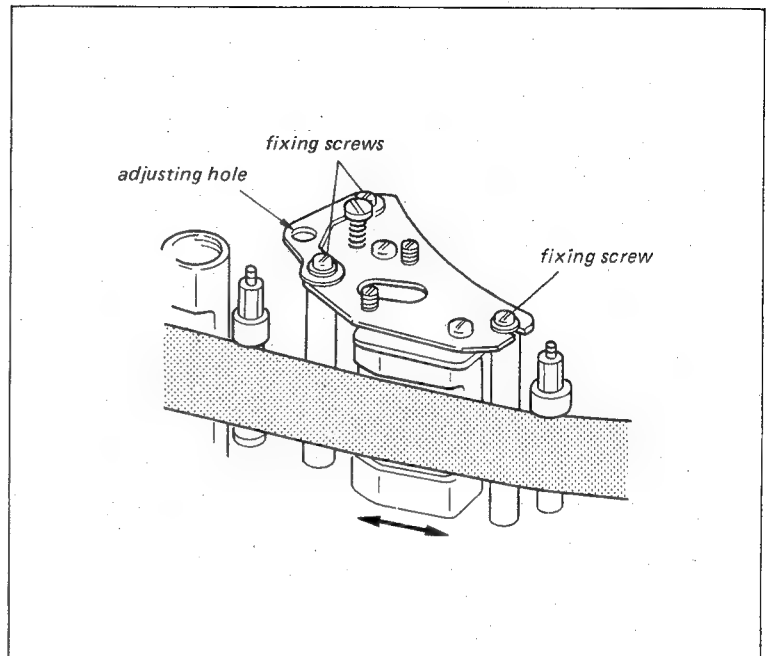
- (1) Connect the oscilloscope to TP6/YD-14 board, and externally trigger from TP3/YD-14 board.
- (2) Playback the color-bar portion of the alignment tape.
- (3) Set the DT SELECT switch to the OFF position.

### Check procedure:

Check that the RF waveform has the maximum amplitude when the TRACKING control knob is set in the detent position.

### Adjustment procedure:

Adjust the position of the audio/CTL head in the direction of the arrow.



## 9-8. VIDEO HEAD DIHEDRAL ADJUSTMENT

Perform this adjustment independently at R/P head and at DT head.

.Video head dihedral adj. and video head azimuth adj. are closely related. If any one of these adjustments is attempted, perform another adjustment at the same time.

### Tool:

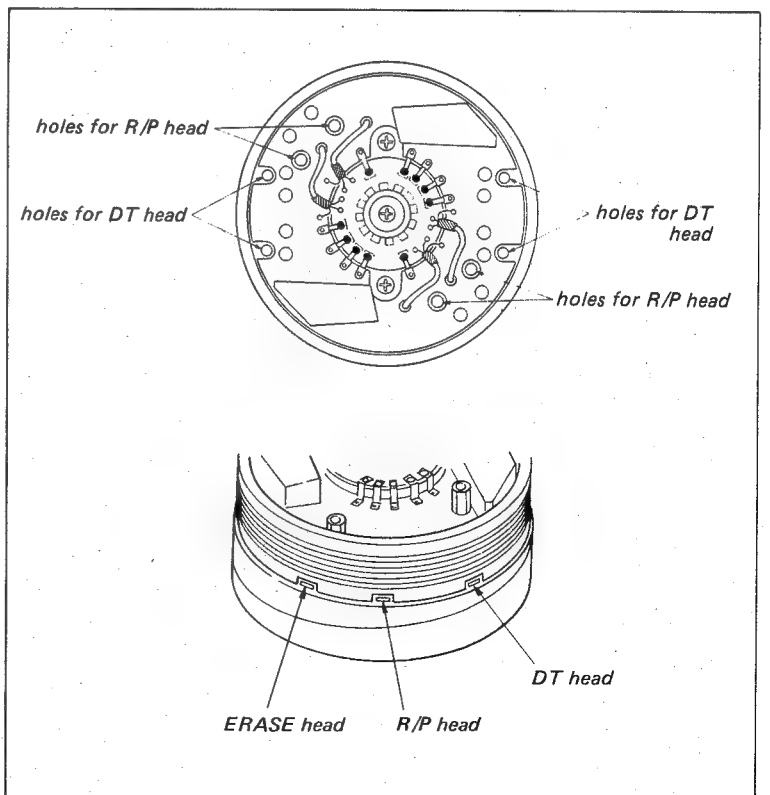
Dihedral adjusting screw (DT)

Alignment tape, RR5-2SB-PAL

Video monitor

### Check procedure:

- (1) Set the DT SELECT switch to the OFF position on the front panel.
- (2) Playback the monoscope portion of the alignment tape.
- (3) Check that one vertical line beneath the switching point on the monitor screen looks divided into two separated lines which normally be one





line. (Check for R/P head dihedral) (If one vertical line looks as two separate lines, dihedral adjustment is necessary. When one line is not divided into two lines, adjustment is not necessary.)

- (4) Set the DT SELECT switch to the SEARCH or VAR position.
- (5) Check as procedure (3) (Check for DT head dihedral)

#### Adjustment procedure:

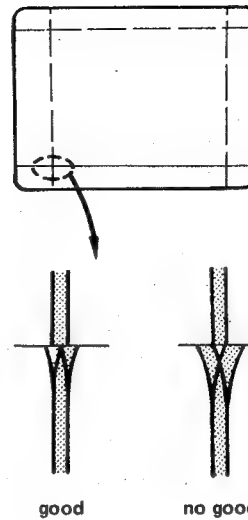
- (1) Screw lightly four dihedral adjusting screw (DT) into the holes A as shown in figure when the R/P head dihedral does not meet the required specification.

If the DT head dihedral does not meet the required specification, screw four screws into the holes B.

- (2) When the R/P head dihedral does not meet the required specification, set the DT SELECT switch to the OFF position.

When the DT head dihedral does not meet the required specification, set the DT SELECT switch to the SEARCH or VAR position. R/P head dihedral adjustment procedure and DT head dihedral adjustment procedure are same as follows.

- (3) Turn either of the two screws adjacent to the video head with white leads until some resistance is felt.
- (4) If this screw is turned further, the video head is moved and the dihedral is adjusted. Therefore, turn this screw an additional quarter turn.
- (5) Check for dihedral distortion. If the distortion has gotten worse, turn this screw back one turn and tighten the other screw a quarter turn. Check again for dihedral distortion and continue in this way until dihedral error is eliminated.





- (6) When the adjustment is completed, remove the four dihedral adjusting screws. After removal, playback the alignment tape and check dihedral again as error sometimes reappears after screws are removed.

## 9-9. VIDEO HEAD AZIMUTH ADJUSTMENT

Perform this adjustment independently at R/P head and at DT head.

### Tool and equipment:

Alignment tape, RR5-2SB-PAL

Oscilloscope

### Preparation:

- (1) Connect the oscilloscope to TP12/RP10 board, and externally trigger from TP3/YD-14 board.
- (2) Turn on the power.
- (3) Playback the RF 8MHz portion of the alignment tape, and adjust the TRACKING control for the maximum RF output signal amplitude.

### Check procedure:

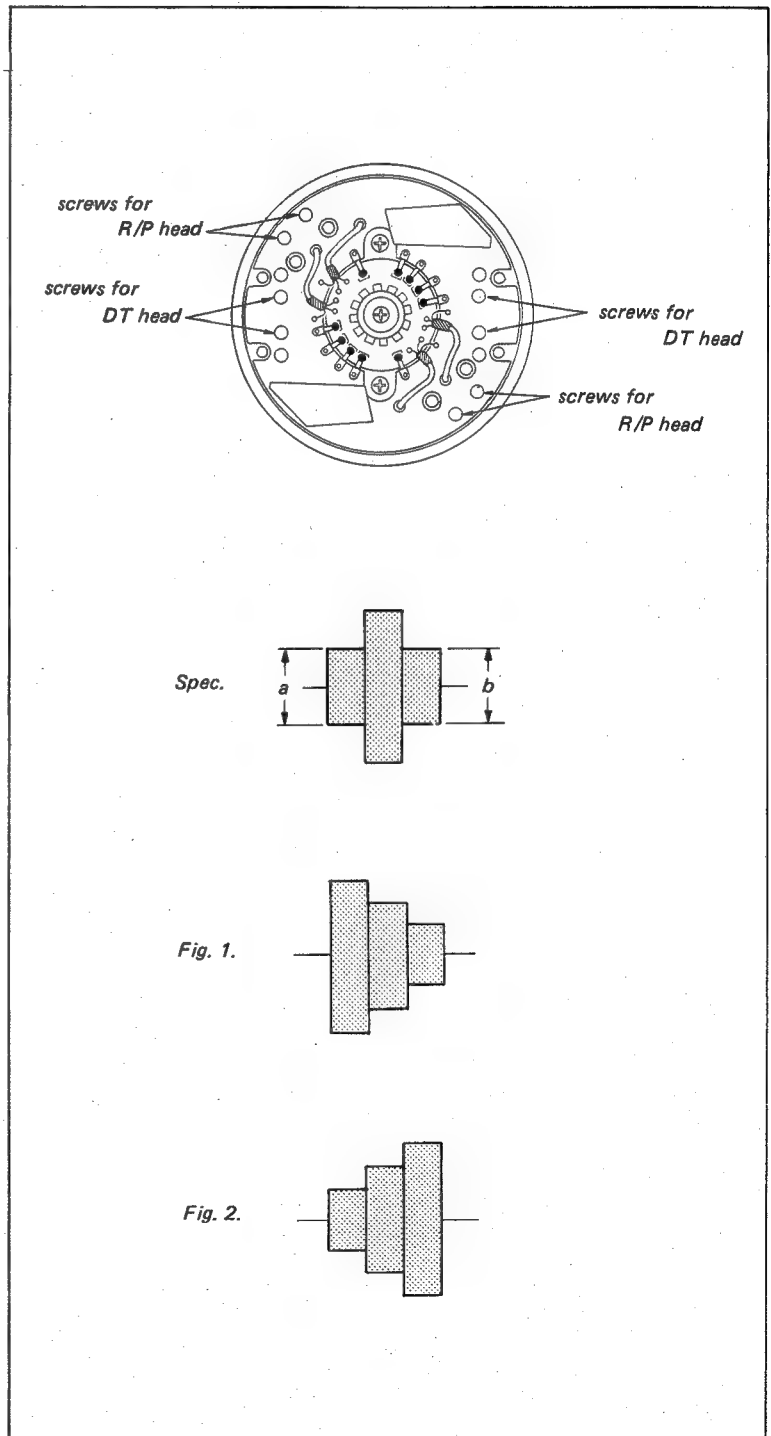
- (1) Set the DT SELECT switch to the OFF position.
- (2) Check that the RF output signal of the amplitude is within the specification (Check for R/P head azimuth).
- (3) Set the DT SELECT switch to the SEARCH or VAR position.
- (4) Check as procedure (2) (Check for DT head azimuth).

### Adjustment procedure:

If the RF output signal for R/P and/or DT head is out of spec. as shown in Fig.1, adjust as follows.

- (1) Put the machine into the STANDBY mode first.
- (2) Locate the R/P and DT head tip with white and yellow leads to the alignment tape side.
- (3) Turn the azimuth adjusting screw that locate the right side of the R/P and/or DT head with white and yellow leads side.

If the RF output signal for R/P and/or DT head is out of specifi-





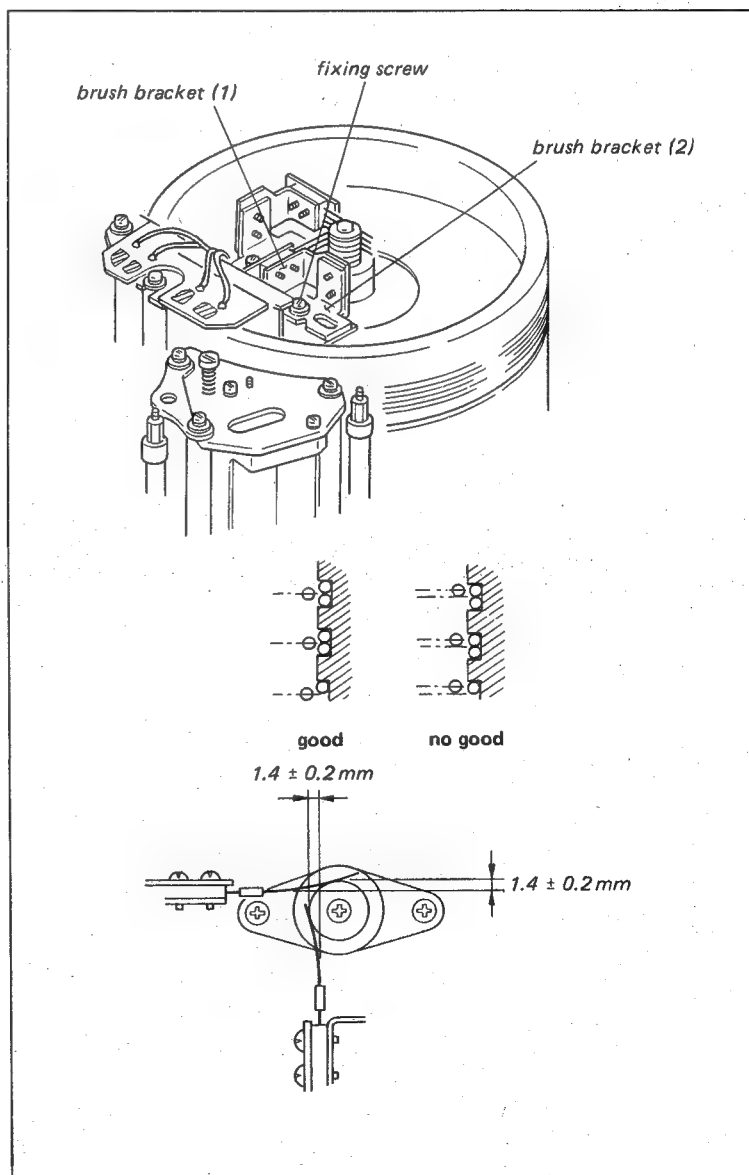
cation as shown in Fig.2, adjust as follows.

- (4) Locate the R/P and DT head tip with white and yellow leads to the alignment tape side.
- (5) Turn the azimuth adjusting screw that locates the left side of the R/P and/or DT head with white and yellow leads side.
- (6) Connect the oscilloscope to TP11/RP10 board.
- (7) Check and/or adjust to the other R/P and/or DT head tip in the same manner as described in step (1) to (5).

#### 9-10. SLIP-RING AND BRUSH POSITION ADJUSTMENT

##### Adjustment procedure:

- (1) Loosen the fixing screw of the brush bracket (2) and disengage the brush from the slip-ring. Tighten the fixing screw.
- (2) Loosen the fixing screw of the brush bracket (1). Adjust the height of the brush bracket (1) to meet the specification.
- (3) Loosen the fixing screw of the brush bracket (2) again. Adjust the position of the brush to meet the specification.





## SECTION 10

### POWER SUPPLY/SYSTEM CONTROL ALIGNMENT

#### [Equipment Required]

- DC Voltmeter
- Oscilloscope
- (BVE-500ACE or BVR-510ACE)

**Note :** Not always to readjust power line for slite out-of-specification so far as servo and video system are normal because it affects servo and video chracteristic.

#### 10-1. SWITCHING REGULATOR ADJUSTMENT

##### 10-1-1. Excess Current Detector Circuit Adjustment

- (1) Turn off the Power Switch and turn the RV2 on PW-79 board fully counterclockwise. (component side view)
- (2) Turn on the Power Switch and adjust the voltage at TP305 on PD board to  $17.0 \pm 0.1V$  by RV1 on PW-79 board.

**Caution :** Care should be taken for adjustment of RV2 as it may damage many compornents if the voltage at TP305/ PD board exceeds 17.1V.

- (3) Turn RV2 on PW-79 board gradually clockwise (component side view) until the voltage at TP305 on PD board will be 0V.

**Note :** Perform 10-1-2 output voltage adjustment successively.

##### 10-1-2. OUTPUT Voltage Adjustment

- (1) Turn off the Power Switch and turn the RV1 on PW-79 board fully counterclockwise. (component side view)
- (2) Wait two minutes or more, then turn on the Power Switch and set to the STOP mode. (with tape threaded)
- (3) Adjust the voltage at TP305 on PD board to  $15.5 \pm 0.1V$  with RV1 on PW-79 board.

**Note :** Confirm the specification of 10-2 REG5V adjustment and 10-3 REG12V adjustment when this output voltage adjustment is performed.

#### 10-2. REG5V ADJUSTMENT

«machine conditions for adjustment»

- STOP mode

«spec.»

- TP304/PD board
- $5.33 \pm 0.01V$

● RV2/PD board

#### 10-3. REG12V ADJUSTMENT

«machine conditions for adjustment»

- STOP mode

«spec.»

- TP301/PD board
- $12.0 \pm 0.1V$

● RV1/PD board

#### 10-4. TAPE BEGINNING/END DETECTOR ADJUSTMENT

«machine conditions for adjustment»

- STOP mode
- without cassette

«spec.»

- TP1/RE-3
- $6.0 \pm 0.2V$

● RV1/RE-3

#### 10-5. SEARCH $\times 10$ MODE DETECTOR ADJUSTMENT

«machine conditions for adjustment»

- FWD SEARCH  $\times 5$  mode (Just before clik position)

«spec.»

- IC41-10/SY-36  
or SY-92

- $A = 18.5 \pm 0.3\mu S$

● RV2/SY-36  
or SY-92





## 10-6. PINCH ROLLER PRESSING TIMING ADJUSTMENT (1)

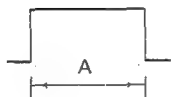
NOTE ; This adjustment is only performed in remote control with 36P remote connector.

### «machine conditions for adjustment»

- REMOTE/LOCAL SW ; REMOTE
- REMOTE 1/2 SW ; 2 (36P)
- Change the mode, REMOTE SEARCH STILL mode to REMOTE SEARCH FWD mode.  
(BVE-500ACE or BVR-510ACE is used in this adjustment.)

### «spec.»

- IC50-6/SY-36  
or SY-92



- $A = 180 \pm 3\text{ms}$

- RV1/SY-36  
or SY-92

## 10-7. PINCH ROLLER PRESSING TIMING ADJUSTMENT (2)

### «machine conditions for adjustment»

- Change the mode, STOP mode to PLAY mode,

### «spec.»

- IC50-10/SY-36  
or SY-92



- $A = 180 \pm 3\text{ms}$

- RV3/SY-36  
or SY-92



# SECTION 11

## SERVO SYSTEM ALIGNMENT

### [Equipment Required]

- Oscilloscope
  - Audio Oscillator
  - Frequency Counter
  - Alignment Tape
- RR5-2SB PAL (Parts No.8-960-020-62)

Time (min.)	Video	Audio	Time code
5	Color bars	3kHz,0dB	1 kHz
5	R-F sweep	-	-
5	Monoscope	-	-
2.5	Modulated 20T pulse	1kHz,0dB	-
2.5	R-F 8MHz	10kHz,-10dB	-

### [Definition of Mode]

Mode	Frequency at TP11 on SV board. (Hz)
PLAY	approx. 450
SEARCH × 1/30	approx. 15
SEARCH × 1/10	approx. 40
SEARCH × 1/5	approx. 83
SEARCH × 1/2	approx. 220
SEARCH × 1	approx. 444
SEARCH × 2	approx. 890
SEARCH × 5	approx. 2230
SEARCH × 10	approx. 450 (Click position)

### [Switch Setting]

- \* Front panel
- INPUT SELECT ..... LINE
- REMOTE/LOCAL ..... LOCAL
- DT SELECT ..... OFF
- PB/PB · EE ..... PB · EE

### 11-1. CAPSTAN FG BIAS ADJUSTMENT

#### «machine conditions for adjustment»

- STOP mode

#### «spec.»

- TP11/SV board
- DUTY =  $50 \pm 2\%$

● RV14/SV board

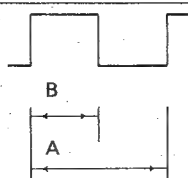
#### «spec.»

- TP12/SV board
- DUTY =  $50 \pm 2\%$

● RV17/SV board

NOTE :

$$DUTY = \frac{B}{A}$$



### 11-2. DRUM FREE SPEED ADJUSTMENT

#### «machine conditions for adjustment»

- STOP mode

#### «spec.»

- TP5/SV board
- DUTY =  $50 \pm 2\%$

● RV4/SV board

NOTE ; After completing this adjustment, perform the section 11-12. Drum Lock Phase Adjustment (RV4 fine adj.).

### 11-3. CAPSTAN FREE SPEED ADJUSTMENT

#### «machine conditions for adjustment»

- STOP mode

#### «spec.»

- TP7/SV board
- DUTY =  $60 \pm 2\%$

● RV11/SV board

### 11-4. SEARCH × 5 ADJUSTMENT

#### «machine conditions for adjustment»

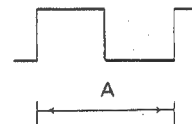
- FWD SEARCH × 5 mode

#### «spec.»

- TP12/SV board

- A =  $0.44 \pm 0.01\text{ms}$

● RV3/SV board



NOTE ; After completing this adjustment, perform the section 11-6. SEARCH × 1 adjustment (RV3 fine adj.).

### 11-5. SEARCH × 1/30 ADJUSTMENT

#### «machine conditions for adjustment»

- FWD SEARCH × 1/30 mode

#### «spec.»

- TP12/SV board

- A =  $67 \pm 10\text{ms}$

● RV15/SV board





## 11-6. SEARCH × 1 ADJUSTMENT (RV3 fine adj.)

### «machine conditions for adjustment»

- FWD SEARCH × 1 mode
- MODE SELECT SW ; TBC

### «spec.»

- TP12/SV board
- $444 \pm 2\text{Hz}$

● RV3/SV board

## 11-7. TRACKING CONTROL CALIBRATION

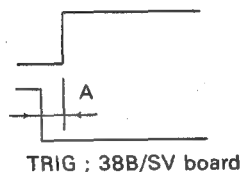
### «machine conditions for adjustment»

- Playback mode ; Alignment tape (Color bar segment)
- TRACKING ; FIXED

### «spec.»

- 38B/SV board

- TP501/CF-9



- $A = 0 \pm 0.05\text{mS}$

● RV1/SV board

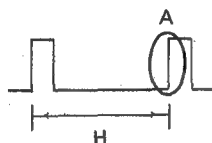
## 11-8. DRUM AFC (H period) ADJUSTMENT

### «machine conditions for adjustment»

- Change the mode, PLAY mode to STILL (SEARCH) mode.

### «spec.»

- TP2/SV board



- Oscilloscope DELAY mode at A portion.
- H period (in PLAY mode)  $\pm 0.05\mu\text{S}$  = H period (in STILL mode)

● RV13/SV board

## 11-9. AFC BIAS ADJUSTMENT

### «machine conditions for adjustment»

- Change the mode, STILL (SEACH) mode to PLAY mode.

### «spec.»

- TP9/SV board
- The dc level at STILL mode = The dc level at PLAY mode

● RV12/SV board

## 11-10. CAPSTAN SPEED DETECTOR ADJUSTMENT

### «machine conditions for adjustment»

- FWD SEARCH × 1/30 mode

### «spec.»

- IC28-6/SV board

- $A = 0.67 \pm 0.01\text{mS}$

● RV2/SV board



## 11-11. SWITCHING POSITION ADJUSTMENT

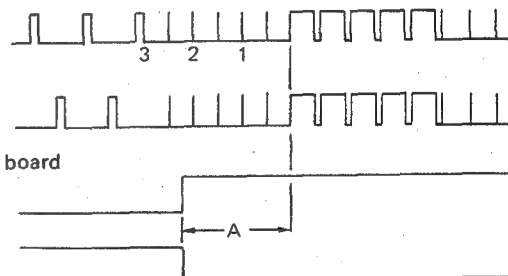
### «machine conditions for adjustment»

- Playback mode ; Alignment tape (Color bar segment)
- Short between TP3 and GND/SV board with jumper.
- Short between TP2 and GND/SV board with jumper.
- TRACKING ; FIXED

### «spec. at the adjustment»

- 5A/SV board

- TP18/SV board



- $A = 2.25 \pm 0.15\text{H}$

● RV6/SV board (rising)

● RV8/SV board (falling)

### «spec. at the checking»

- $A = 2.25 \begin{smallmatrix} +0.75 \\ -1.75 \end{smallmatrix} \text{H}$

NOTE ; Once the switching position adjustment is completed to  $2.25\text{H} \pm 0.15\text{H}$ , if the data measured using another alignment tape is within  $0.5\text{H} - 3.0\text{H}$ . This is acceptable because of tape tolerance.



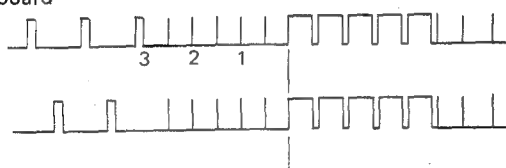
## 11-12. DRUM LOCK PHASE ( $\phi^2$ LOOP) ADJUSTMENT (RV4 fine adj.)

### «machine conditions for adjustment»

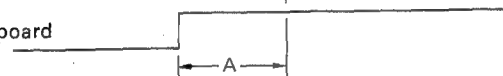
- REC mode
- VIDEO IN ; Color bar
- Short between TP3 and GND/SV board with jumper.
- Short between TP2 and GND/SV board with jumper.
- Short between IC100-6 pin (or IC5-6 pin) and GND/SV board with jumper. (S/N. up to 10300)  
(S/N. 10301 and higher)

### «spec.»

- TP15/SV board



- TP18/SV board



- $A = 2.25 \pm 0.15H$

- RV4/SV board

## 11-13. PICTURE SPLITTING COMPENSATOR ADJUSTMENT

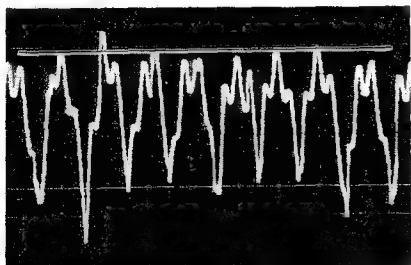
NOTE ; This adjustment is not necessary in normal service operation except when the variable resistor, upper drum assy and/or drum assy is replaced.

### «machine conditions for adjustment»

- Playback mode ; Alignment tape (monoscope segment)

### «spec.»

- TP19/SV board



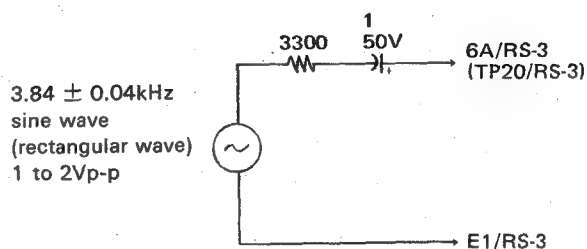
- Flatten the peak level as possible as maximum level.

- RV9/SV board
- RV10/SV board

## 11-14. TAKE UP REEL MOTOR SPEED ADJUSTMENT

### «machine conditions for adjustment»

- Cassette up mode
- Confirm that dc level at TP24 on RS-3 board is  $12 \pm 0.2V$ .
- Connect the sine wave (or rectangular wave) at 6A on RS-3 board.



### «spec.»

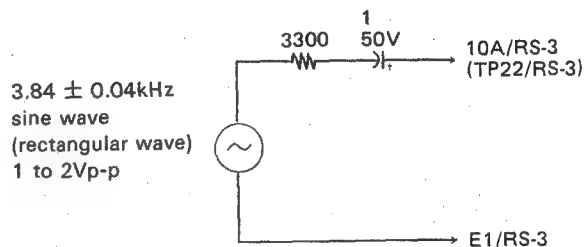
- TP4/RS-3
- $5 \pm 0.05V$

- RV1/RS-3

## 11-15. SUPPLY REEL MOTOR SPEED ADJUSTMENT

### «machine conditions for adjustment»

- Cassette up mode
- Confirm that dc level at TP24 on RS-3 board is  $12 \pm 0.2V$ .
- Connect the sine wave (or rectangular wave) at 10A on RS-3 board.



### «spec.»

- TP10/RS-3
- $5 \pm 0.05V$

- RV2/RS-3



## 11-16. CAPSTAN SYNCHRONIZE ADJUSTMENT

### «machine conditions for adjustment»

- Playback mode ; Alignment tape (Color bar segment)
- Connect between 3A and CN1-39/SV board with 10k $\Omega$  resistor.

### «spec.»

- TP12/SV board
- $470 \pm 1\text{Hz}$

● RV16/SV board

## 11-17. REF 135degrees BURST PULSE ADJUSTMENT

### «machine conditions for adjustment»

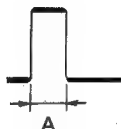
- EE mode
- VIDEO IN ; color bar

### «spec.»

- TP702/CF-9

- $A = 10 \pm 5\mu\text{S}$

● RV502/CF-9



## 11-18. PB 135degrees BURST PULSE ADJUSTMENT

### «machine conditions for adjustment»

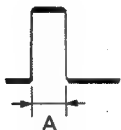
- Playback mode ; Alignment tape (Color bar segment)
- VIDEO IN ; color bar

### «spec.»

- TP701/CF-9

- $A = 15 + 5\mu\text{S}$   
-  $10\mu\text{S}$

● RV501/CF-9



### NOTE ;

- RV2/RE-3 (Take-up Reel Motor Current Sense Adjustment)
- RV3/RE-3 (Supply Reel Motor Current Sense Adjustment)
- RV501/RS-4 (T Tension Detector 0 gram Point Adjustment)
- RV502/RS-4 (T Tension Detector 100 gram Point Adjustment)
- RV503/RS-4 (S Tension Detector 0 gram Point Adjustment)
- RV504/RS-4 (S Tension Detector 100 gram Point Adjustment)

Refer to the Mechanical Alignment.



## 11-19. DYNAMIC TRACKING CONTROL SYSTEM ADJUSTMENT

NOTE 1 : • Turn the S1/DT board "ON", after adjustment turn "OFF".

- Serial No. 10501 and higher or P.C. board parts No. 1-606-919-14 and later.

Turn the S2/DT board "OFF", after adjustment turn "ON".

Serial No. up to 10500 or P.C. board parts No. 1-606-919-11, -12, -13.

Remove the jumper between PIN8 and PIN14 of IC16/DT board, after adjustment reconnect the jumper to unsoldered portion.

Preset the variable resistor facing to the component side.

### «Adjustment of RV3/DT board»

- Turn RV13/DT board(CH-B) to fully counterclockwise.
- Perform the section 11-19-11. DT Slope Offset Adjustment.
- Perform the section 11-19-12. Automatic Tracking Gain Adjustment.

### «Adjustment of RV4/DT board»

- Perform the section 11-19-11. Wobbling Gain Adjustment.

### «Adjustment of RV5/DT board»

- Turn RV4/DT board(CH-B) to fully counterclockwise.
- Perform the section 11-19-6. Hysteresis Cancel Level Adjustment.
- Perform the section 11-19-11. Wobbling Gain Adjustment.

### «Adjustment of RV7 or RV8/DT board»

- Turn RV13/DT board(CH-B) to fully counterclockwise.
- Turn RV14/DT board(CH-A) to fully clockwise.
- Perform the section 11-19-10. DT Slope Level Adjustment.
- Perform the section 11-19-12. Automatic Tracking Gain Adjustment.

### «Adjustment of RV13 or RV14/DT board»

- Perform the section 11-19-12. Automatic Tracking Gain Adjustment.

### «Adjustment of either RV9, RV10, RV11, RV12, RV15 or RV16/DT board»

- Perform the section 11-19-13. DT Self-record/Playback Adjustment.

### «Adjustment of RV19/DT board»

- Perform the section 11-19-1. Drum Rotation Detector Adjustment.

NOTE 2 ;

#### «Adjustment of A or B channel»

- DT mode (Turn DT SELECT switch "VAR").
- Connect the oscilloscope to TP6 and TP3/YD board and set into CHOP mode.

CH-A (TP3/YD board is "LOW" level.)

CH-B (TP3/YD board is "HIGH" level.)

- Perform section 11-19-1. to section 11-19-13. for A or B channel.

NOTE 3 ;

#### «Adjustments of all variable resistor on DT board.»

- Perform section 11-19-1. to section 11-19-13.

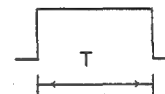
## 11-19-1. Drum Rotation Detector Adjustment

### «machine conditions for adjustment»

- Change the mode, STANDBY mode to STANDBY OFF mode. (Perform this adjustment while the drum is rotating.)

### «spec.»

- TP38/DT board (IC63-10)



- $T = 22 \pm 0.5\text{ms}$

- RV19/DT board

## 11-19-2. Preparation for DT Adjustment

- Turn RV4/DT board to fully counterclockwise.
- Turn RV7/DT board (CH-B) to fully counterclockwise.
- Turn RV8/DT board (CH-A) to fully counterclockwise.
- Turn RV13/DT board (CH-B) to fully counterclockwise.
- Turn RV14/DT board (CH-A) to fully clockwise.
- Turn RV15/DT board (CH-B) to fully clockwise.
- Turn RV16/DT board (CH-A) to fully clockwise. (adjust from component side).

- Turn the S1/DT board "ON", after adjustment turn "OFF".

- Serial No. 10501 and higher or P.C. board parts No. 1-606-919-14 and later.

Turn the S2/DT board "OFF", after adjustment turn "ON".

Serial No. up to 10500 or P.C. board parts No. 1-606-919-11, -12, -13.

Remove the jumper between PIN8 and PIN14 of IC16/DT board after adjustment reconnect jumper to unsoldered portion.

- Oscilloscope TRIG ; TP5/DT board



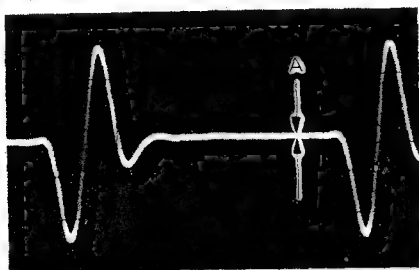
### 11-19-3. DT Slope Offset Preadjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

#### «spec.»

- TP23/DT board



- Straighten at "A" portion. (Be horizontal.)

RV3/DT board

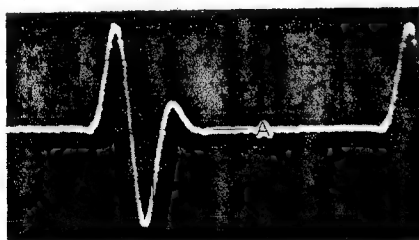
### 11-19-4. DT Operating Point Preadjustment (NORMAL)

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

#### «spec.»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- Adjust the DC level at "A" portion to  $0 \pm 5V$ .

RV10/DT board (CH-B)

RV12/DT board (CH-A)

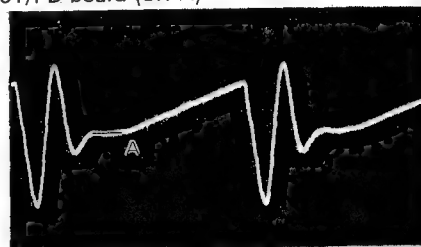
### 11-19-5. DT Operating Point Preadjustment (FWD $\times 2$ )

#### «machine conditions for adjustment»

- FWD SEARCH  $\times 2$  mode
- DT SELECT SW ; VAR

#### «spec.»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- Adjust the DC level at "A" portion to  $0 \pm 5V$ .

RV9/DT board (CH-B)

RV11/DT board (CH-A)

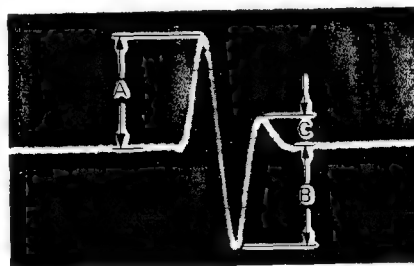
### 11-19-6. Hysteresis Cancel Level Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

#### «spec.»

- TP101/PD board (CH-B)



- $A = 100 \pm 7V$ ,  $B = 89 \pm 8V$ ,  $C = 28 \pm 4V$

RV5/DT board



### 11-19-7. DT Gain Preadjustment

#### «machine conditions for adjustment»

- FWD SEARCH  $\times 1/30$  mode
- DT SELECT SW ; VAR

#### «spec.»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- DC level's maximum fluctuation at "A" portion =  $65 \pm 5V$ .

RV15/DT board (CH-B)

RV16/DT board (CH-A)

NOTE: The DC level (portion A) will not fluctuate without turning RV15 or RV16.

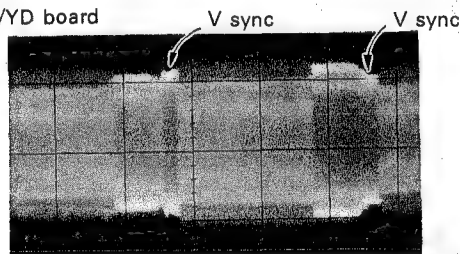
### 11-19-8. DT Operating Point (RV10,12 fine adj.)

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- Turn the DT SELECT SW "OFF", and then maximize waveform at TP6/YD board with TRACKING VR.
- Next turn the DT SELECT SW "VAR".

#### «spec. 1»

- TP6/YD board



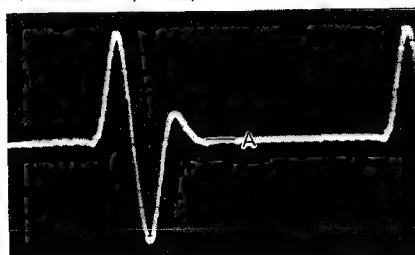
- Maximize the V sync level.

RV10/DT board (CH-B)

RV12/DT board (CH-A)

#### «spec. 2»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- The DC level at "A" portion is  $0 \pm 17V$ .

Satisfy the spec. 1 and the spec. 2.

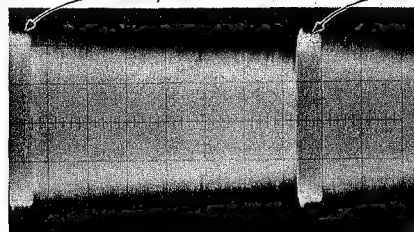
### 11-19-9. DT Gain Adjustment (RV15,16 fine adj.)

#### «machine conditions for adjustment»

- FWD SEARCH  $\times 1/30$  mode
- DT SELECT SW ; VAR

#### «spec.»

- TP6/YD board V sync



- Maximize the V sync level.

RV15/DT board (CH-B)

RV16/DT board (CH-A)

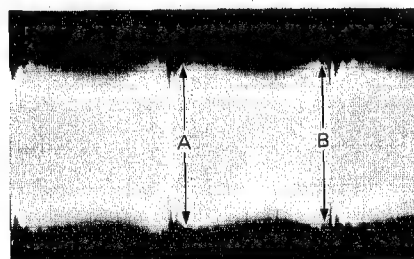
### 11-19-10. DT Slope Level Adjustment

#### «machine conditions for adjustment»

- REV SEARCH  $\times 1$  mode
- DT SELECT SW ; VAR

#### «spec.»

- TP6/YD board



- $A = B$

RV7/DT board (CH-B)

RV8/DT board (CH-A)



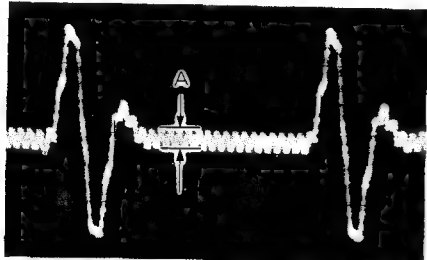
### 11-19-11. Wobbling Gain/DT Slope Offset Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

#### «spec.»

- TP101/PD board (CH-B)



- $A = 11 \pm 1V$

- RV4/DT board (gain)

- Straighten at wobbling portion. (The slope is within 5V.)

- RV3/DT board (slope offset)

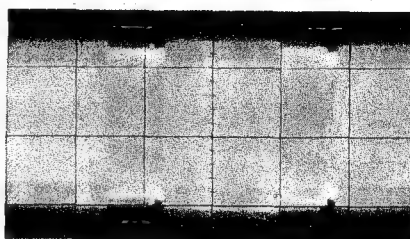
### 11-19-12. Automatic Tracking Gain Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR
- Short between TP35 and GND/DT board with jumper.

#### «spec.»

- TP6/YD board

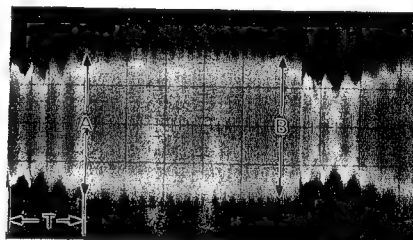


- Made to 70 percent of maximum level.

- TRACKING VR

#### «spec.»

- TP6/YD board



$T = 8ms$  (R64/DT-3 = 100K)

$T = 4ms$  (R64/DT-3 = 51K)

- $A \approx B$

- RV13/DT board (CH-B)

(Turn in fully counterclockwise first, and then turn slowly in clockwise to meets the specification.)  
(adjust from component side)

- RV14/DT board (CH-A)

(Turn in fully clockwise first, and then turn slowly in counterclockwise to meets the specification.)  
(adjust from component side)



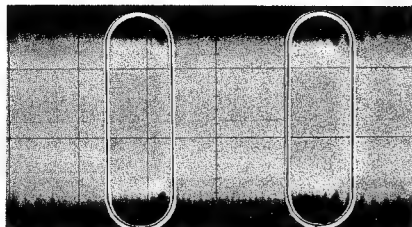
### 11-19-13. DT Self-record/Playback Adjustment

#### «machine conditions for adjustment»

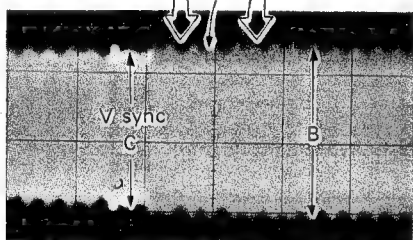
- VIDEO IN ; color bar
- PB/PB • EE SW ; PB
- DT SELECT SW ; VAR
- Playback self-recorded portion.

#### «spec. 1»

- TP6/YD board



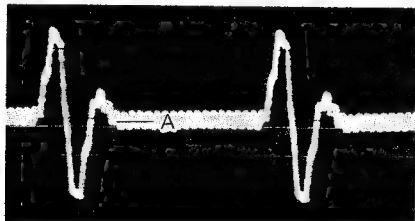
- Oscilloscope : DELAY mode



- Maximize the level of V sync portion.
- Adjust the frequency at "A" portion to two times of wobbling frequency. (wobbling frequency : 800Hz)
- $\frac{C}{B}$  = more than 0.95 (CONF mode)  
= more than 0.8 (REV SEARCH  $\times$  1, PLAY, FWD  $\times$  1/30, FWD  $\times$  2 and FWD  $\times$  3 modes)

#### «spec. 2»

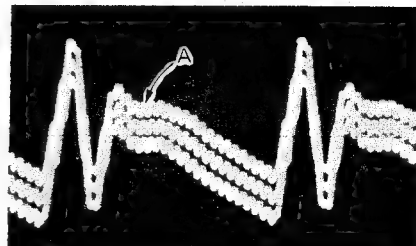
- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- To check that the DC level at "A" portion is  $0 \pm 17V$ .

#### «spec. 3»

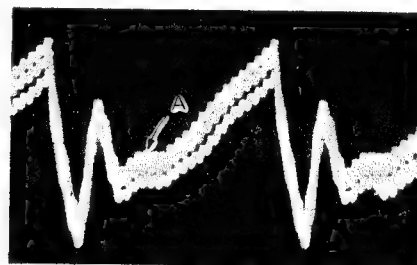
- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- To check that the DC level at "A" portion is more than spec.2 DC level.

#### «spec. 4»

- TP101/PD board (CH-B)
- TP201/PD board (CH-A)



- To check that the positive going peak DC level and the negative going peak DC level are equal on the reference of spec.2 DC level.

Playback the self-recorded portion.

- Fine adjust the following variable resistor to meet the specification 1.

RV10/DT board (CH-B)

RV12/DT board (CH-A)

- Check that the specification 2 is met.



CONF mode.

Turn PB/PB • EE SW "PB" in REC mode.

- Fine adjust the following variable resistor to meet the specification 1.

RV15/DT board (CH-B)

RV16/DT board (CH-A)





Playback the self-recorded portion in FWD  $\times 1/30$  mode.

- Fine adjust the following variable resistor to meet the specification 1.

●RV15/DT board (CH-B)

●RV16/DT board (CH-A)

- Check that the specification 3 is met.



Playback the self-recorded portion in REV  $\times 1$  mode.

- Fine adjust the following variable resistor to meet the specification 1.

●RV15/DT board (CH-B)

●RV16/DT board (CH-A)



Playback the self-recorded portion in FWD  $\times 2$  mode.

- Fine adjust the following variable resistor to meet the specification 1.

●RV9/DT board (CH-B)

●RV11/DT board (CH-A)

- Check that the specification 4 is met.



Playback the self-recorded portion in FWD  $\times 3$  mode.

- Fine adjust the following variable resistor to meet the specification 1.

●RV9/DT board (CH-B)

●RV11/DT board (CH-A)

Repeat the above adjustments two or three times to meet all specifications.

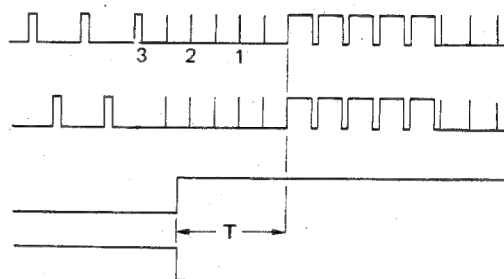
## 11-20. DT SWITCHING POSITION ADJUSTMENT (1)

### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- TRACKING ; FIXED
- DT SELECT SW ; VAR
- Short between TP2 and GND/SV board with jumper.

### «spec.»

- 5A/SV board



- TP18/SV board

- $T = 2.25 \pm 0.15H$

●RV7/SV board (rising)

●RV5/SV board (falling)

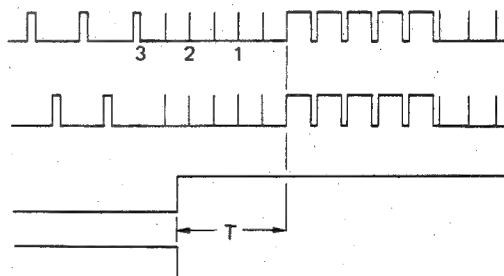
## 11-21. DT SWITCHING POSITION ADJUSTMENT (2)

### «machine conditions for adjustment»

- FWD SEARCH  $\times 2$  or  $\times 3$  mode ; Alignment tape (color bar segment)
- TRACKING ; FIXED
- DT SELECT SW ; VAR
- Short between TP2 and GND/SV board with jumper.

### «spec.»

- 5A/SV board



- TP18/SV board

- $T = 2.25 \pm 0.15H$

●RV402 (R402)/SV board (rising)

●RV401 (R401)/SV board (falling)



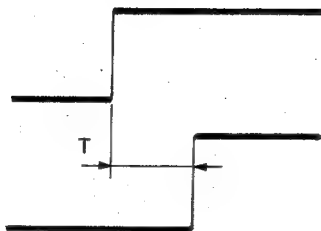
## 11-22. DT × 2, × 3 mode SWITCHING POSITION ADJUSTMENT

### «machine conditions for adjustment»

- FWD SEARCH × 2 or × 3 mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR
- MODE SELECT SW ; TBC

### «spec.»

- TP4/FC board



- TP5/FC board

- $T = 560 \pm 20 \mu S$

- RV1/FC board

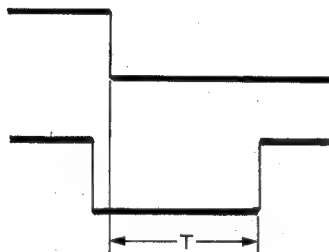
## 11-23. FH PHASE ADJUSTMENT

### «machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- DT SELECT SW ; VAR

### «spec.»

- TP26/DT board



- TP27/DT board

- $T = 21 \pm 1 \mu S$

- RV20/DT board

## 11-24. ASSEMBLE COMPENSATOR ADJUSTMENT

NOTE ; 1. Perform adjustments of section 11-2 (Drum Free Speed), section 11-11 (Switching Position) and 11-12 (Drum Lock Phase) before this adjustment.

2. Applicable serial No. 10301 and later. (PAL)  
(P.C. board part No. 1-607-914-13 and later.)

### «machine conditions for adjustment»

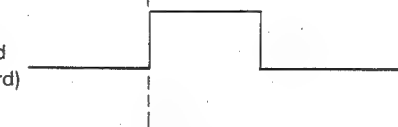
- REC mode
- VIDEO IN ; color bar

### «spec.»

- TP15/SV board



- IC100-6/SV board  
(or IC5-6/SV board)



equalize the phase

- RV100/SV board







## SECTION 12

### AUDIO SYSTEM ALIGNMENT

#### [Equipment Required]

- Audio Oscillator
  - Audio Attenuator
  - VTVM
  - Frequency Counter
  - Oscilloscope
  - Blank Tape
  - Alignment Tape
- RR5-2SB PAL (Parts No.8-960-020-62)

Time (min.)	Video	Audio	Time code
5	Color bars	3kHz,0dB	1kHz
5	R-F sweep	—	—
5	Monoscope	—	—
2.5	Modulated 20T pulse	1kHz,0dB	—
2.5	R-F 8MHz	10kHz,-10dB	—

#### [Switch/VR Setting]

- \* Front Panel
- AUDIO MONITOR ..... CH-1
- TRACKING ..... FIXED
- VIDEO ..... AUTO
- AUDIO LIMITER ..... OFF
- MIXING SELECT ..... OFF
- MODE SELECT ..... NORMAL
- INPUT SELECT ..... LINE
- SKEW ..... CLICK
- REMOTE 1/2 ..... 2 (36P)
- REMOTE/LOCAL ..... LOCAL
- PB/PB • EE ..... PB • EE
- \* Rear Panel
- AUDIO IN LEVEL ..... LOW

#### 12-1. AUDIO LEVEL CONTROL SETTING

##### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -60dB

##### «spec.»

- 21A/AU-13 (CH-1)
- $0 \pm 0.5\text{dB}$

##### RV1/AO-3

##### «spec.»

- 34A/AU-13 (CH-2)
- $0 \pm 0.5\text{dB}$

##### RV2/AO-3

NOTE ; The AUDIO LEVEL CONTROL should not be touched until rest of section 12 AUDIO SYSTEM ALIGNMENT are completed.

#### 12-2. OUTPUT LEVEL ADJUSTMENT

##### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -60dB

##### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

##### RV1/AO-3

##### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

##### RV2/AO-3

#### 12-3. MONITOR OUT LEVEL ADJUSTMENT

##### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -60dB
- AUDIO MONITOR SW ; CH-1

##### «spec.»

- AUDIO MONITOR OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

##### RV3/AO-3

##### Reference

(AUDIO MONITOR SW ; at MIX  $7 \pm 2\text{dB}$ )

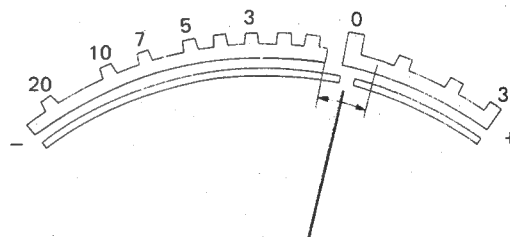
#### 12-4. LEVEL METER CALIBRATION

##### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1kHz, -60dB

##### «spec.»

- VU meter



- $0 \pm 0.5$  scale

##### RV5/AU-13 (CH-1)

##### «spec.»

- $0 \pm 0.5$  scale

##### RV105/AU-13 (CH-2)



## 12-5. LIMITER LEVEL ADJUSTMENT

### «machine conditions for adjustment»

- EE mode
- AUDIO IN ; 1 kHz, -30dB
- LIMITER SW ; ON

### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- $7 \pm 0.5\text{dB}$

●RV3/AU-13 (CH-1)

### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- $7 \pm 0.5\text{dB}$

●RV103/AU-13 (CH-2)

## 12-6. PLAYBACK FREQUENCY RESPONSE /LEVEL ADJUSTMENT

### «machine conditions for adjustment»

- Playback mode ; Alignment tape (1kHz/10kHz segment)

### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- 10kHz PB Level  
= (1kHz PB Level -10dB)  $\pm 1.5\text{dB}$

●RV1/AU-13 (CH-1)

### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- 10kHz PB Level  
= (1kHz PB Level -10dB)  $\pm 1.5\text{dB}$

●RV101/AU-13 (CH-2)

## 12-7. PLAYBACK OUTPUT LEVEL ADJUSTMENT

### «machine conditions for adjustment»

- PLAYback mode ; Alignment tape (1kHz segment)
- Adjust the AUDIO PB LEVEL at same degrees of AUDIO REC LEVEL.

### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

●RV2/AU-13 (CH-1)

### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- $4 \pm 0.5\text{dB}$

●RV102/AU-13 (CH-2)

## 12-8. BIAS OSCILLATOR FREQUENCY ADJUSTMENT

### «machine conditions for adjustment»

- REC mode

### «spec.»

- TP501/AU-25
- $70 \pm 2\text{kHz}$

●LV501/AU-25

## 12-9. AUDIO ERASE CURRENT ADJUSTMENT (1)

### «machine conditions for adjustment»

- REC mode

### «spec.»

- TP511/AU-25
- Maximum level

●LV506/AU-25

## 12-10. AUDIO ERASE CURRENT ADJUSTMENT (2)

### «machine conditions for adjustment»

- CH-1 INSERT mode

### «spec.»

- TP511/AU-25
- Maximum level

●LV505/AU-25

## 12-11. AUDIO ERASE CURRENT ADJUSTMENT (3)

### «machine conditions for adjustment»

- CH-2 INSERT mode

### «spec.»

- TP511/AU-25
- Maximum level

●LV504/AU-25



## 12-12. RECORD BIAS CURRENT ADJUSTMENT (1)

### «machine conditions for adjustment»

- REC mode
- Turn RV501/AU-25 fully counterclockwise. (CH-1)  
(adjust from soldering side)
- Turn RV502/AU-25 fully counterclockwise. (CH-2)  
(adjust from soldering side)

### «spec.»

- TP502/AU-25 (CH-1)
- Maximum level

● LV502/AU-25 (CH-1)

### «spec.»

- TP503/AU-25 (CH-2)
- Maximum level

● LV503/AU-25 (CH-2)

NOTE ; After completing this adjustment, perform the section  
12-16. Record Bias Current Adjustment (2).

## 12-13. BIAS TRAP ADJUSTMENT (1)

### «machine conditions for adjustment»

- REC mode
- AUDIO IN ; no signal

### «spec.»

- TP2/AU-13 (CH-1)
- Minimum level

● LV2/AU-13 (CH-1)

### «spec.»

- TP102/AU-13 (CH-2)
- Minimum level

● LV102/AU-13 (CH-2)

## 12-14. BIAS TRAP ADJUSTMENT (2)

### «machine conditions for adjustment»

- CH-1 INSERT mode

### «spec.»

- TP101/AU-13
- Minimum level

● LV101/AU-13

## 12-15. BIAS TRAP ADJUSTMENT (3)

### «machine conditions for adjustment»

- CH-2-INSERT mode

### «spec.»

- TP1/AU-13
- Minimum level

● LV1/AU-13

## 12-16. RECORD BIAS CURRENT ADJUSTMENT (2)

### «machine conditions for adjustment»

- REC mode

### «spec.»

- TP1/AU-13 (CH-1)
- 12mVrms

● RV501/AU-25 (CH-1)

### «spec.»

- TP101/AU-13 (CH-2)
- 12mVrms

● RV502/AU-25 (CH-2)

## 12-17. RECORD CURRENT LEVEL ADJUSTMENT

### «machine conditions for adjustment»

- REC mode
- AUDIO IN ; 1kHz, -60dB

- Turn RV7/AU-13 fully counterclockwise. (CH-1)  
(adjust from soldering side) ... (S/N. up to 10400)
- Turn RV107/AU-13 fully counterclockwise. (CH-2)  
(adjust from soldering side) ... (S/N. up to 10400)

### «spec.»

- TP3/AU-13 (CH-1)
- $-1 \pm 1.0\text{dB}$

● RV4/AU-13 (CH-1)

### «spec.»

- TP103/AU-13 (CH-2)
- $-1 \pm 1.0\text{dB}$

● RV104/AU-13 (CH-2)

NOTE ; After completing this adjustment, perform the section  
12-19. Record Current Frequency Response Adjust-  
ment (2).



## 12-18. RECORD CURRENT FREQUENCY RESPONSE ADJUSTMENT (1)

### «machine conditions for adjustment»

- REC mode
- AUDIO IN ; 18kHz, -90dB

- Turn RV7/AU-13 fully counterclockwise. (CH-1)  
(adjust from soldering side) ... S/N. up to 10400
- Turn RV107/AU-13 fully counterclockwise. (CH-2)  
(adjust from soldering side) ... S/N. up to 10400

### «spec.»

- TP3/AU-13 (CH-1)
- Maximum level

● LV3/AU-13 (CH-1)

### «spec.»

- TP103/AU-13 (CH-2)
- Maximum level

● LV103/AU-13 (CH-2)

NOTE ; After completing this adjustment, perform the section 12-19. Record Current Frequency Response Adjustment (2).

## 12-19. RECORD CURRENT FREQUENCY RESPONSE ADJUSTMENT (2)

### «machine conditions for adjustment»

- REC mode
- AUDIO IN ; 10kHz, -60dB

### «spec.»

- TP3/AU-13 (CH-1)
- Maximum level

● RV7/AU-13 (CH-1)

### «spec.»

- TP103/AU-13 (CH-2)
- Maximum level

● RV107/AU-13 (CH-2)

## 12-20. CROSSTALK CANCEL ADJUSTMENT (1)

### «machine conditions for adjustment»

- CH-1 INSERT mode
- Use the tape that is not recorded of the AUDIO signal.

### «spec.»

- CH-2 AUDIO OUT (600Ω terminated)
- Minimum level

● RV6/AU-13

## 12-21. CROSSTALK CANCEL ADJUSTMENT (2)

### «machine conditions for adjustment»

- CH-2 INSERT mode
- Use the tape that is not recorded of the AUDIO signal.

### «spec.»

- CH-1 AUDIO OUT (600Ω terminated)
- Minimum level

● RV106/AU-13

## 12-22. CH-1 INSERT OFF DELAY TIME ADJUSTMENT

### «machine conditions for adjustment»

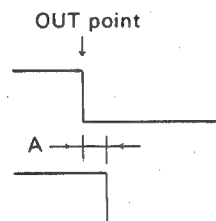
- Change the mode, CH-1 INSERT mode to ENTRY OUT mode.

### «spec.»

• TP201/AU-13

• TP202/AU-13

TRIG ; SINGLE TP201/AU-13 (-)



NOTE ; Applicable parts number 1-604-337-11 to -15.

•  $A = 120 \pm 10\text{mS}$

● RV202/AU-13

### Reference

When  $A < 120\text{mS}$  ; Turn the RV202 clockwise.  
(adjust from soldering side)

When  $A > 120\text{mS}$  ; Turn the RV202 counterclockwise.  
(adjust from soldering side)

NOTE ; Applicable parts number 1-604-337-16 and later.

•  $A = 80 \pm 10\text{mS}$

● RV202/AU-13

### Reference

When  $A < 80\text{mS}$  ; Turn the RV202 clockwise.  
(adjust from soldering side)

When  $A > 80\text{mS}$  ; Turn the RV202 counterclockwise.  
(adjust from soldering side)



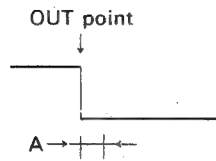
## 12-23. CH-2 INSERT OFF DELAY TIME ADJUSTMENT

### «machine conditions for adjustment»

- Change the mode, CH-2 INSERT mode to ENTRY OUT mode.

### «spec.»

- TP204/AU-13



- TP205/AU-13

TRIG ; SINGLE TP204/AU-13 (—)

NOTE ; Applicable parts number 1-604-337-11 to -15.

- $A = 120 \pm 10\text{ms}$

- RV204/AU-13

### Reference

When  $A < 120\text{ms}$  ; Turn the RV204 clockwise.  
(adjust from soldering side)

When  $A > 120\text{ms}$  ; Turn the RV204 counterclockwise.  
(adjust from soldering side)

NOTE ; Applicable parts number 1-604-337-16 and later.

- $A = 80 \pm 10\text{ms}$

- RV204/AU-13

### Reference

When  $A < 80\text{ms}$  ; Turn the RV204 clockwise.  
(adjust from soldering side)

When  $A > 80\text{ms}$  ; Turn the RV204 counterclockwise.  
(adjust from soldering side)

## 12-24. CH-1 BIAS ON DELAY TIME ADJUSTMENT

NOTE ; Applicable parts number 1-604-337-11 to -15.

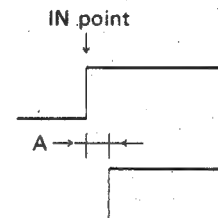
NOTE ; This adjustment is not necessary for parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- Change the mode, STOP mode to CH-1 INSERT mode.

### «spec.»

- TP202/AU-13



- TP506/AU-25

TRIG ; SINGLE TP202/AU-13 (+)

- $A = 100 \pm 10\text{ms}$

- RV203/AU-13

### Reference

When  $A < 100\text{ms}$  ; Turn the RV203 clockwise.  
(adjust from soldering side)

When  $A > 100\text{ms}$  ; Turn the RV203 counterclockwise.  
(adjust from soldering side)



## 12-25. CH-2 BIAS ON DELAY TIME ADJUSTMENT

NOTE ; Applicable parts number 1-604-337-11 to -15.

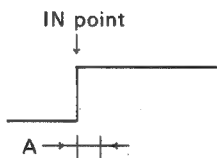
NOTE; This adjustment is not necessary for parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- Change the mode, STOP mode to CH-2 INSERT mode.

### «spec.»

- TP205/AU-13



- TP507/AU-25



TRIG ; SINGLE TP205/AU-13 (+)

- $A = 100 \pm 10\text{mS}$

- RV205/AU-13

### Reference

When  $A < 100\text{mS}$  ; Turn the RV205 clockwise.  
(adjust from soldering side)

When  $A > 100\text{mS}$  ; Turn the RV205 counterclockwise.  
(adjust from soldering side)

## 12-26. CH-1 REC OFF DELAY TIME ADJUSTMENT

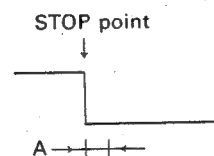
NOTE ; Applicable parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- Change the mode, CH-1 REC mode to STOP mode.

### «spec.»

- TP202/AU-13



- TP203/AU-13



TRIG ; SINGLE TP202/AU-13 (-)

- $A = 50 \pm 5\text{mS}$   
- 0mS

- RV208/AU-13

### Reference

When  $A < 50\text{mS}$  ; Turn the RV208 clockwise.  
(adjust from soldering side)

When  $A > 50\text{mS}$  ; Turn the RV208 counterclockwise.  
(adjust from soldering side)

## 12-27. CH-1 REC/EE OFF DELAY TIME ADJUSTMENT

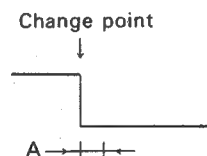
NOTE ; Applicable parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- STOP mode
- PB/PB • EE SW ; Change the switch PB • EE to PB position.

### «spec.»

- TP202/AU-13



- TP207/AU-13



TRIG ; SINGLE TP202/AU-13 (-)

- $A = 60 \pm 5\text{mS}$   
- 0mS

- RV206/AU-13

### Reference

When  $A < 60\text{mS}$  ; Turn the RV206 clockwise.  
(adjust from soldering side)

When  $A > 60\text{mS}$  ; Turn the RV206 counterclockwise.  
(adjust from soldering side)



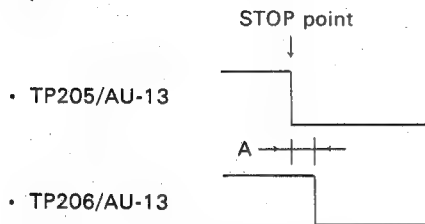
## 12-28. CH-2 REC OFF DELAY TIME ADJUSTMENT

NOTE ; Applicable parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- Change the mode, CH-2 REC mode to STOP mode.

### «spec.»



- TP205/AU-13

- TP206/AU-13

TRIG ; SINGLE TP205/AU-13 (-)

- $A = 50 \pm 5\text{mS}$   
- 0mS

### RV209/AU-13

### Reference

When  $A < 50\text{mS}$  ; Turn the RV209 clockwise.  
(adjust from soldering side)

When  $A > 50\text{mS}$  ; Turn the RV209 counterclockwise.  
(adjust from soldering side)

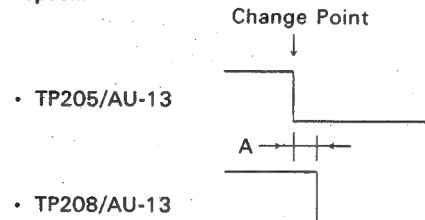
## 12-29. CH-2 REC/EE OFF DELAY TIME ADJUSTMENT

NOTE ; Applicable parts number 1-604-337-16 and later.

### «machine conditions for adjustment»

- STOP mode
- PB/PB • EE SW ; Change the switch PB • EE to PB position.

### «spec.»



- TP205/AU-13

- TP208/AU-13

TRIG ; SINGLE TP205/AU-13 (-)

- $A = 60 \pm 5\text{mS}$   
- 0mS

### RV207/AU-13

### Reference

When  $A < 60\text{mS}$  ; Turn the RV207 clockwise.  
(adjust from soldering side)

When  $A > 60\text{mS}$  ; Turn the RV207 counterclockwise.  
(adjust from soldering side)







## SECTION 13

### VIDEO SYSTEM ALIGNMENT

#### [Equipment Required]

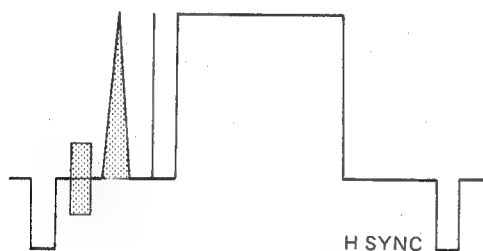
- Oscilloscope
- Frequency Counter
- Blank Tape
- Alignment Tape
- RR5-2SB PAL (Parts No.8-960-020-62)

Time (min.)	Video	Audio	Time code
5	Color bars	3kHz,0dB	1 kHz
5	R-F sweep	—	—
5	Monoscope	—	—
2.5	Modulated 20T pulse	1kHz,0dB	—
2.5	R-F 8MHz	10kHz,-10dB	—

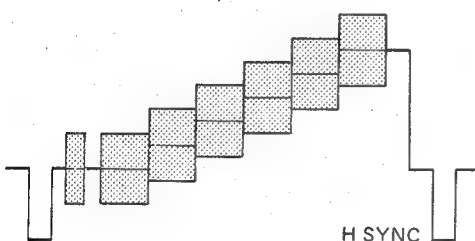
- Video Signal Generator
- Video Sweep Generator
- DC Voltmeter
- Vectorscope

#### [Video Signal Required]

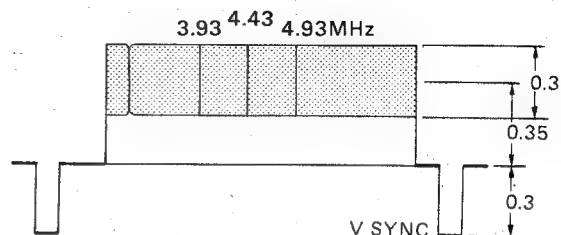
- 75% color bar signal
- B/W Video Signal
- Modulated 20T pulse signal



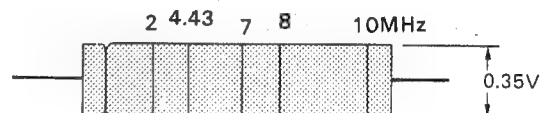
- Linearity (5 STEP) Signal



- Gated Sweep Signal



- Sweep Signal



#### [Switch/VR Setting]

##### \* Front Panel

AUDIO MONITOR .....	MIX
HEADPHONES LEVEL .....	MID
TRACKING .....	FIXED
VIDEO .....	AUTO
AUDIO LIMITER .....	OFF
MIXING SELECT .....	OFF
MODE SELECT .....	NORMAL
INPUT SELECT .....	LINE
SKEW .....	CLICK
REMOTE 1/2 .....	2 (36P)
REMOTE/LOCAL .....	LOCAL
DT SELECT .....	OFF
PB/PB • EE .....	PB • EE

##### \* Rear Panel

FRAMING SERVO .....	ON
VIDEO IN .....	ON
SERVO LOCK .....	AUTO



## 13-1. PLAYBACK AMPLIFIER ADJUSTMENT

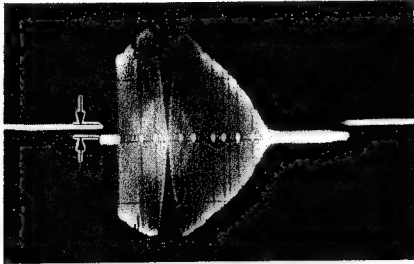
### 13-1-1. DC Balance Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (RF sweep segment)
- Short between TP2 and GND/SV board with jumper.

#### «spec.»

- TP4/YD board



TRIG ; TP3/YD board

- Equalize the DC levels of both channels.
- RV3/YD board

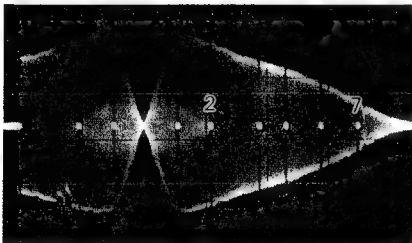
### 13-1-2. RF 7MHz Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (RF sweep segment)
- Short between TP2 and GND/SV board with jumper.
- Turn RV2/YD board (CH-A) fully counterclockwise. (adjust from the component side)
- Turn RV1/YD board (CH-B) fully counterclockwise. (adjust from the component side)

#### «spec.»

- TP6/YD board



TRIG ; TP3/YD board

- Belinear of envelope 2MHz to 7MHz.
- RV4/RP board (CH-A)
- RV6/RP board (CH-B)

NOTE ; After completing this adjustment, perform the section 13-1-3. RF 5.4MHz adjustment.

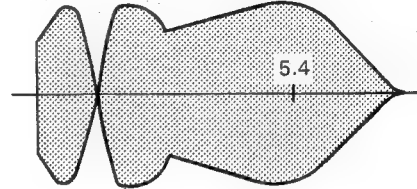
### 13-1-3. RF 5.4MHz Tuning

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (RF sweep segment)
- Short between TP2 and GND/SV board with jumper.
- Turn RV2/YD board (CH-A) fully clockwise. (adjust from the component side)
- Turn RV1/YD board (CH-B) fully clockwise. (adjust from the component side)

#### «spec.»

- TP6/YD board



TRIG ; TP3/YD board

- Maximize the level at 5.4MHz portion.

- LV2/YD board (CH-A)
- LV1/YD board (CH-B)

NOTE ; After completing this adjustment, perform the section 13-1-4. RF Frequency Response adjustment

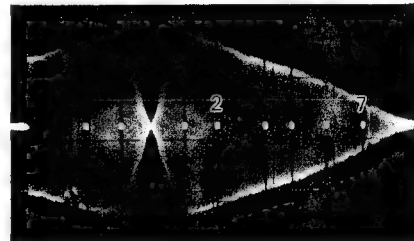
### 13-1-4. RF Frequency Response Adjustment

#### «machine conditions for adjustment»

- Playback mode ; Alignment tape (RF sweep segment)
- Short between TP2 and GND/SV board with jumper.

#### «spec.»

- TP6/YD board



TRIG ; TP3/YD board

2MHz	7MHz
100% reference	35 ± 5%

- RV2/YD board (CH-A)
- RV1/YD board (CH-B)

Change the DT SW, OFF position to VAR position.

- Equalize the waveforms, at OFF position's waveform and VAR position's waveform.

- RV9/RP board (CH-A)
- RV10/RP board (CH-B)



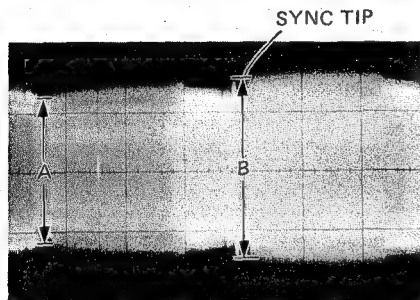
### 13-1-5. Y-RF Balance/Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP29/YD board



TRIG ; TP3/YD board

- $A = B$
- RV4/YD board (balance)
- $A = 0.3 \pm 0.04V$  (SYNC TIP portion)
- RV6/YD board (level, pre-adjustment)

Change the DT SW, OFF position to VAR position.

- $A = B = 0.34 \pm 0.04V$  (SYNC TIP portion)
- RV7/RP board (CH-A)
- RV8/RP board (CH-B)

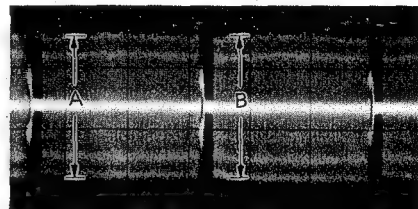
### 13-1-6. Chroma RF Balance/Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP10/YD board



TRIG ; TP3/YD board

- $A = B$
- RV5/YD board (balance)
- $A = 0.1 \pm 0.01V$
- RV7/YD board (level)

Change the DT SW, OFF position to VAR position.

- $A = B$
- RV302/YD board (balance)
- $A = 0.1 \pm 0.01V$
- RV301/YD board (level)

### 13-1-7. Audio Bias Trap Adjustment

«machine conditions for adjustment»

- Install the recorded tape that the CTL signal is only pre-recorded (video signal is not recorded), and put the AUDIO CH-1 INSERT mode.

«spec.»

- TP9/YD board
- Minimize the level
- LV3/YD board



## 13-2. Y DEMODULATOR ADJUSTMENT

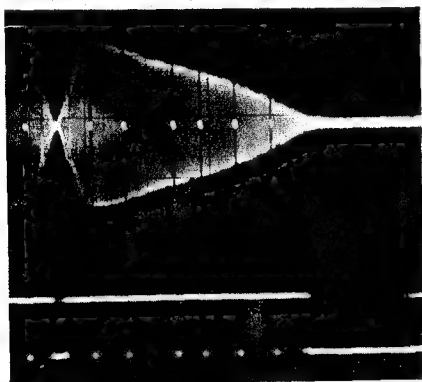
### 13-2-1. Dropout Compensator Sensitivity Adjustment

«machine conditions for adjustment»

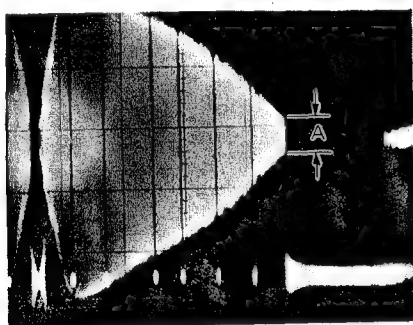
- Playback mode ; Alignment tape (RF sweep segment)

«spec.»

- TP29/YD board



- TP12/YD board
- Oscilloscope ADD mode



- Turn in fully counterclockwise first, and then turn slowly in clockwise to meets the specification.
- $A = 34 \pm 5\text{mV}$

- RV8/YD board

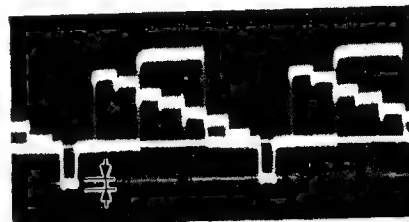
### 13-2-2. Carrier Balance Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP22/YD board



- Minimize the noise level at SYNC portion.

- RV9/YD board

### 13-2-3. V BLK Pulse Width Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

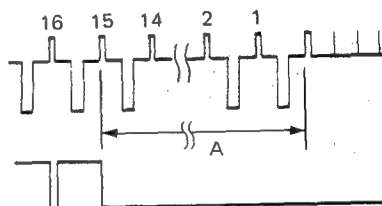
«spec.»

- TP202/YD board

- TP201/YD board

- $A = 15\text{H}$

- RV201/YD board



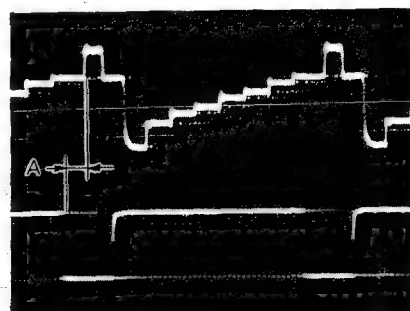
### 13-2-4. H BLK Pulse Width Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP202/YD board



- TP201/YD board

- $A = 6 \pm 1\mu\text{S}$

- RV202/YD board



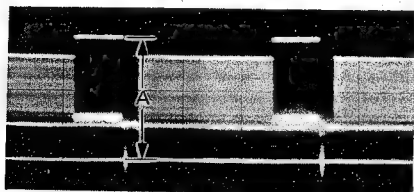
### 13-2-5. B/W Mode Y Output Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)
- Short between TP10 and GND/YD board with jumper.

«spec.»

- VIDEO OUT (75Ω terminated)



- $A = 1 \pm 0.05V$

●RV10/YD board

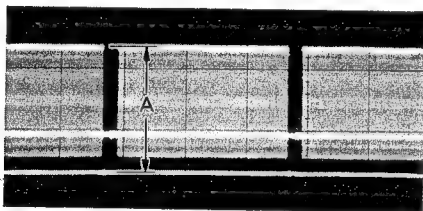
### 13-2-6. COLOR Mode Y Output Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- VIDEO OUT (75Ω terminated)



- $A = 1 \pm 0.05V$

●RV12/YD board

### 13-2-7. Dropout Compensator Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP27/YD board



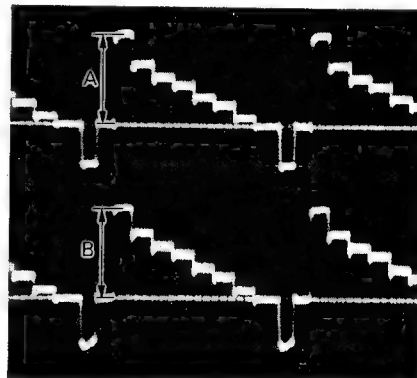
- Equalize the levels, pedestal level and compensated portion level.

NOTE ; Normally switching point comes in video portion (2.25H before V sync), so when you perform DOC level adj., turn a TRACKING VR to move switching point in EQ pulse portion (just before V sync) for easy adj..

●RV14/YD board

«spec.»

- TP22/YD board



- TP24/YD board

- $A = B$

●RV13/YD board

●LV4/YD board

## 13-3. CHROMA DEMODULATOR ADJUSTMENT

### 13-3-1. REF OSC Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP2/CD board
- $4,433,619 \pm 5Hz$

●T1/CD board



### 13-3-2. DT Blanking Pulse Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

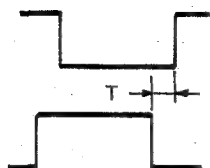
«spec.»

- 39A/CD board

- 35A/CD board

- $T = 0 \pm 25 \mu S$

- RV404/CD board



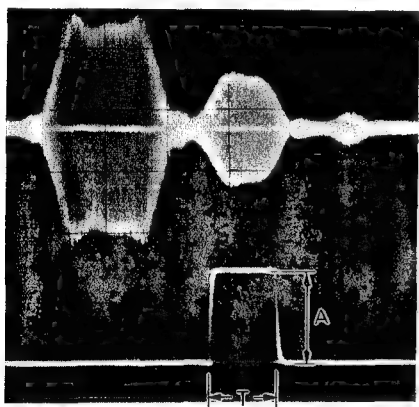
### 13-3-3. ACC Burst Flag Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP6/CD board



- TP110/CD board

- $A = 4.5 \pm 0.1V$

- RV110/CD board (level)

- $T = 2.2 \pm 0.1 \mu S$

- RV109/CD board (width)

- Phase the center positions of the burst and the burst flag pulse.

- RV108/CD board (phase)

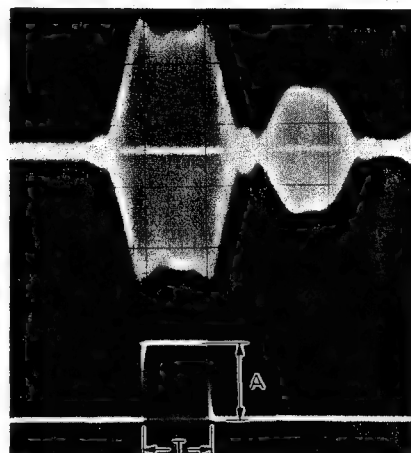
### 13-3-4. APC Burst Flag Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP6/CD board



- TP104/CD board

- $A = 3.4 \pm 0.1V$

- RV104/CD board (level)

- $T = 2.2 \pm 0.1 \mu S$

- RV103/CD board (width)

- Phase the center positions of the pilot burst and the burst flag pulse.

- RV102/CD board (phase)

### 13-3-5. VCO Frequency Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP3/CD board

- $8.4 \pm 0.05V$

- RV106/CD board



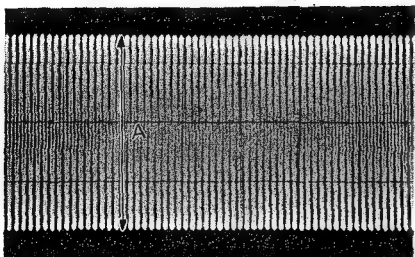
### 13-3-6. PB5.36MHz Tuning Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP108/CD board



- $A = 0.6 \pm 0.1V$   
 $- 0.05V$

- RV107/CD board

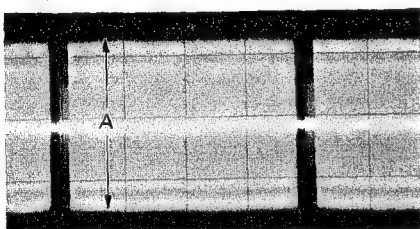
### 13-3-7. ACC Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- TP4/CD board



TRIG ; TP5/CD board

- $A = 0.8 \pm 0.05V$

- RV1/CD board

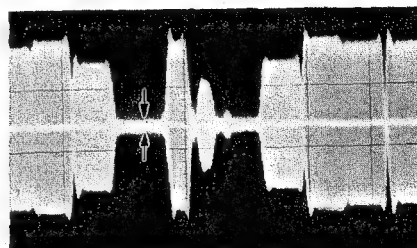
### 13-3-8. Converter Balance Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP6/CD board



- Minimize the carrier leak.

- RV5/CD board

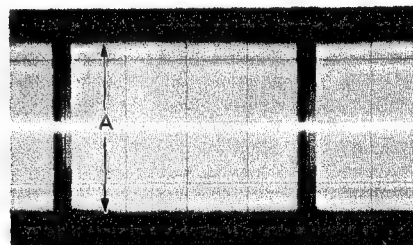
### 13-3-9. DUB Chroma Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (color bar segment)

«spec.»

- 31B/CD board



- $A = 1 \pm 0.1V$

- RV399/CD board



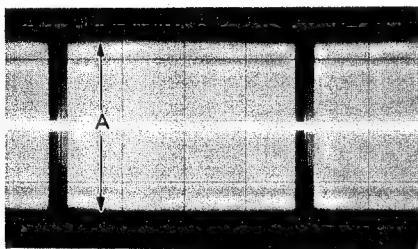
### 13-3-10. High Speed ACC Level Adjustment

**«machine conditions for adjustment»**

- Playback mode ; Alignment tape (color bar segment)
- Turn the RV401/CD board fully clockwise.  
(adjust from the soldering side)

**«spec.»**

- TP9/CD board



TRIG ; 13A/CD board

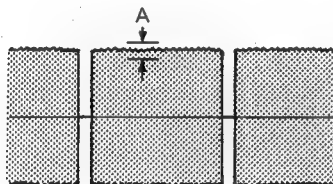
- $A = 0.6 \pm 0.02V$

- RV406/CD board

NOTE ; Turn fully clockwise first, and then turn slowly in counterclockwise to meets the specification.  
(adjust from the component side)

Change the DT SW, OFF position to VAR position.

- TP9/CD board



TRIG ; 13A/CD board

- Minimize the A amplitude.

- RV401/CD board

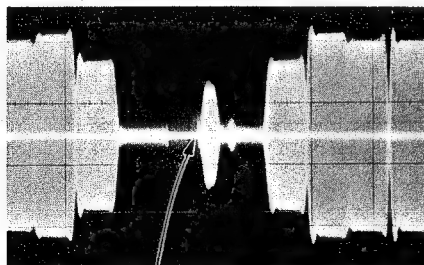
### 13-3-11. Pilot Burst Gate Pulse Adjustment

**«machine conditions for adjustment»**

- Playback mode ; Alignment tape (color bar segment)

**«spec.»**

- TP9/CD board



front edge

- Mute to front edge of burst.

- RV105/CD board

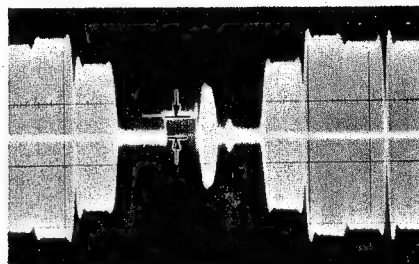
### 13-3-12. Pilot Burst Eliminator DC Level Adjustment

**«machine conditions for adjustment»**

- Playback mode ; Alignment tape (color bar segment)

**«spec.»**

- TP9/CD board



- Equalize the DC levels.

- RV2/CD board

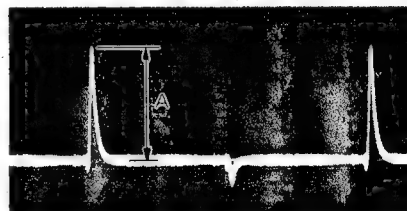
### 13-3-13. PB 135degrees Burst Tuning

**«machine conditions for adjustment»**

- Playback mode ; Alignment tape (color bar segment)

**«spec.»**

- TP501/CD board



- Maximize the A level.

- LV501/CD board

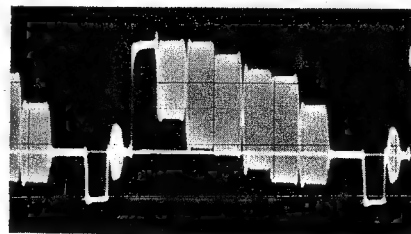
### 13-3-14. Y/C Mix Level Adjustment

**«machine conditions for adjustment»**

- Playback mode ; Alignment tape (color bar segment)

**«spec.»**

- TP204/CD board



- Adjust the chroma level to Y 100% level.

- RV201/CD board



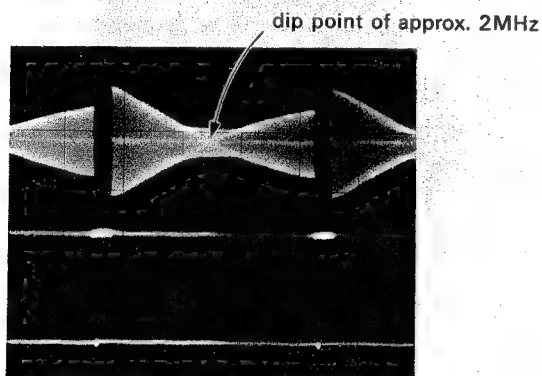
### 13-3-15. Noise Canceller Adjustment

«machine conditions for adjustment»

- Remove YD board from the set.
- Turn RV203/CD board fully counterclockwise. (adjust from component side)
- Feed a 80mVp-p gated sweep signal to 36A/CD board.

«spec.»

- TP204/CD board



- Minimize the dip point level.

- RV202/CD board

NOTE ; After completing this adjustment, insert the YD board to the set.

NOTE ; After completing this adjustment, perform the section 13-3-14. Noise Canceller Low-range Compensator Adjustment.

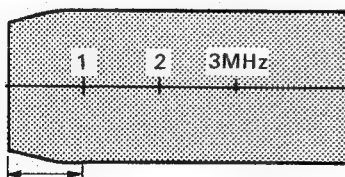
### 13-3-16. Noise Canceller Low-range Compensator Adjustment

«machine conditions for adjustment»

- Remove YD board from the set.
- Feed a 1Vp-p gated sweep signal to 36A/CD board.

«spec.»

- TP204/CD board



- Flatten the 0MHz to 1MHz portion.

- RV203/CD board

NOTE ; After completing this adjustment, insert the YD board to the set.

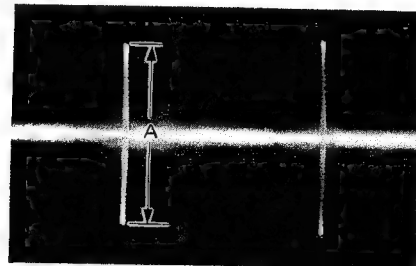
### 13-3-17. Time Code Detector Level Adjustment

«machine conditions for adjustment»

- Playback mode ; Alignment tape (time code segment)

«spec.»

- TP206/YD board



- $A = 2.8 \pm 0.1V$

- RV303/YD board

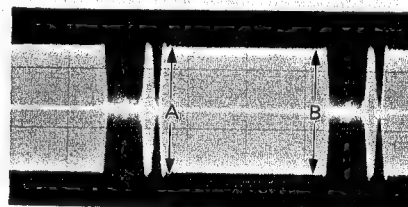
### 13-3-18. DG Compensator Adjustment

«machine conditions for adjustment»

- Playback self-recorded portion.
- VIDEO IN ; Linearity (5 STEP) signal (with sub-carrier and burst)

«spec.»

- TP6/CD board



- $A = B$

- RV7/CD board

### 13-3-19. TBC VCO Shift Adjustment

«machine conditions for adjustment»

- SEARCH mode ; Alignment tape (color bar segment)
- Turn the dial to FWD and then STILL position.
- MODE SELECT SW ; TBC

«spec.»

- TP3/CD board
- $9.15 \pm 0.05V$

- RV302/CD board

«machine conditions for adjustment»

- SEARCH mode ; Alignment tape (color bar segment)
- Turn the dial to REV and then STILL position.
- MODE SELECT SW ; TBC

«spec.»

- TP3/CD board
- $7.7 \pm 0.05V$

- RV301/CD board



### 13-4. MODULATOR ADJUSTMENT

#### 13-4-1. Sync Tip Carrier Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; no signal

«spec.»

- TP9/MD board
- $4.8 \pm 0.05\text{MHz}$

RV4/MD board

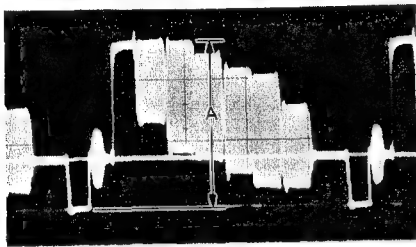
#### 13-4-2. FM Deviation Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- VIDEO OUT (75Ω terminated)



- $A = 1 \pm 0.05\text{V}$

RV1/MD board

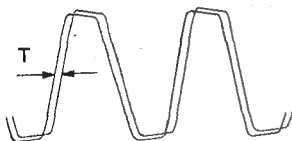
#### 13-4-3. Modulator Balance Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; no signal

«spec.»

- TP9/MD board ; Scope CH-A
- TP9/MD board (INVERT) ; Scope CH-B
- CH-A, CH-B ; ALT mode



- $T = 0$

RV3/MD board

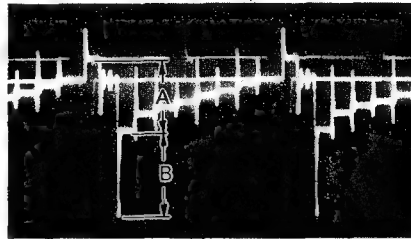
#### 13-4-4. White Clip Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar
- Short between TP7 and TP8/MD board with jumper.

«spec.»

- TP12/MD board



TRIG ; TP5/MD board

$$\frac{B}{A} = \frac{120 + 5}{100}$$

RV2/MD board

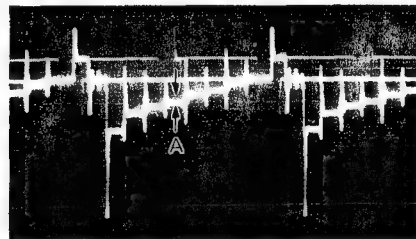
#### 13-4-5. SC Trap Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar
- Short between TP7 and TP8/MD board with jumper.

«spec.»

- TP12/MD board



TRIG ; TP5/MD board

- Minimize the A amplitude. (4.43MHz)

LV1/MD board



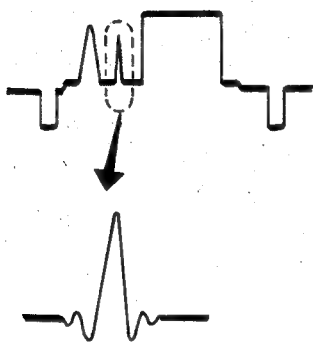
### 13-4-6. Modulator Frequency Response Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; modulated 20T pulse

«spec.»

- TP3/MD board



- Equalize the both levels, pre-shoot level and under-shoot level.

- RV6/MD board

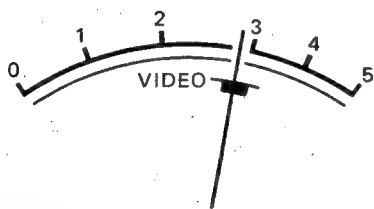
### 13-4-7. Video Meter Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar
- VIDEO SW ; AUTO

«spec.»

- VIDEO/RF meter



- Set the indication in the center of blue scale.

- RV202/MD board

### 13-4-8. 5.36MHz Oscillator Adjustment

«machine conditions for adjustment»

- EE mode

«spec.»

- TP109/MD board
- $5,357,437 \pm 4\text{Hz}$

- CV101/MD board

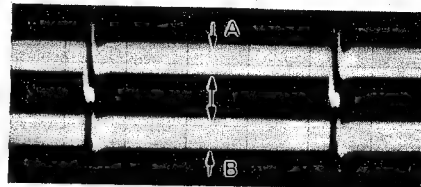
### 13-4-9. APC fo Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP104/MD board



- $A = B$

- T101/MD board

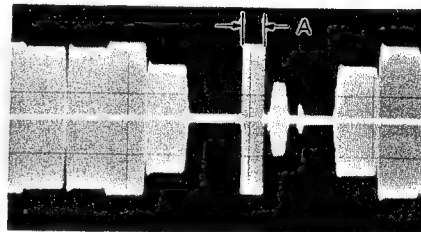
### 13-4-10. Pilot Burst Width Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP107/MD board



- $A = 3.5 \pm 0.1\mu\text{S}$

- RV103/MD board

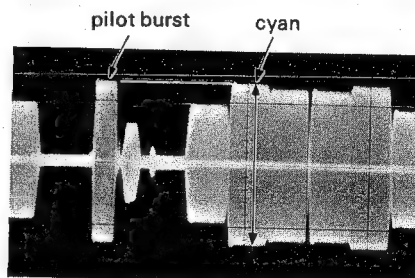
### 13-4-11. Pilot Burst Level/REC Chroma Level Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP108/MD board



- Equalize the both levels, pilot burst level and cyan level.

- RV101/MD board (pilot burst)

- Cyan level =  $0.4 \pm 0.02\text{V}$

- RV10/MD board (REC chroma)



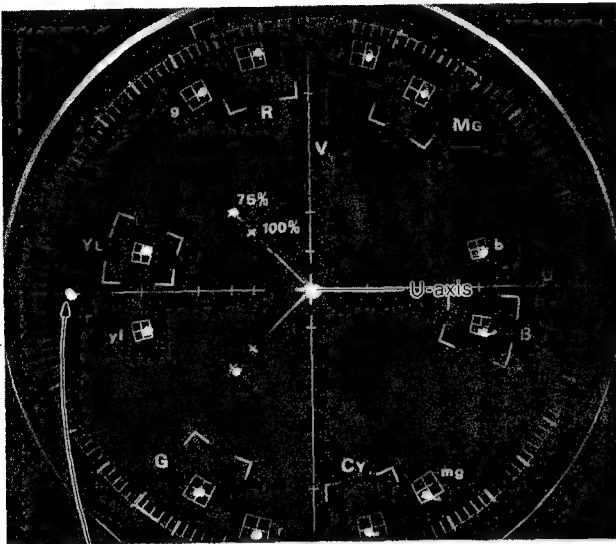
### 13-4-12. Pilot Burst Phase Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP107/MD board



PILOT BURST

- Phase the pilot burst to the U-axis with  $\pm 1^\circ$  degree.

RV101/MD board

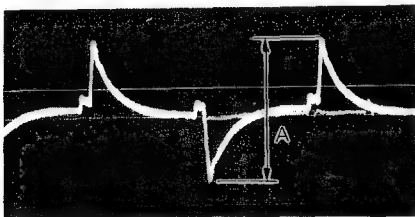
### 13-4-13. REF 135degrees Burst Pulse Level Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP206/MD board



- $A = 1.0 \pm 0.2V$

RV203/MD board

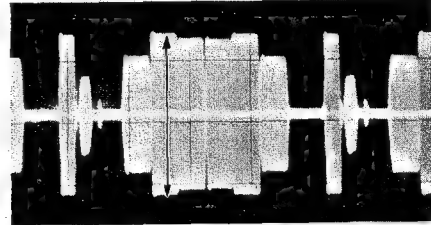
### 13-4-14. REC ACC Level Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar

«spec.»

- TP102/MD board



- Chroma Level =  $0.8 \pm 0.02V$

RV102/MD board

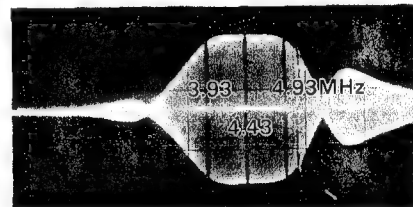
### 13-4-15. REC Chroma Frequency Response Adjustment

«machine conditions for adjustment»

- EE mode
- VIDEO IN ; gated sweep signal (with burst)

«spec.»

- TP108/MD board



4.43MHz	3.93MHz	4.93MHz
100% reference	$90 \pm 5\%$	$90 \pm 5\%$

FL101/MD board



## 13-5. RECORD AMPLIFIER ADJUSTMENT

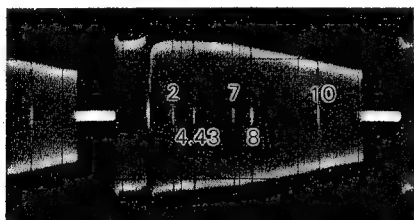
### 13-5-1. Record Current Frequency Response Adjustment

#### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; B/W signal
- Short between TP4 and E2/RP board with jumper.
- Unsolder between TP5 and TP6/RP board (CH-A), and connect low resistor (1 to 5.1Ω) to unsoldered portion.
- Unsolder between TP8 and TP9/RP board (CH-B), and connect low resistor (1 to 5.1Ω) to unsoldered portion.
- Short between TP6 and GND/RP board with jumper. (CH-A)
- Short between TP9 and GND/RP board with jumper. (CH-B)
- Feed a sweep signal to TP3/RP board.

#### «spec.»

- TP5/RP board (GND ; TP6) ..... CH-A



2MHz	4.43MHz	7MHz	8MHz	10MHz
100% reference	100 ± 10%	94 ± 10%	84 ± 5%	64 ± 5%

#### RV3/RP board (CH-A)

#### «spec.»

- TP8/RP board (GND ; TP9) ..... CH-B

2MHz	4.43MHz	7MHz	8MHz	10MHz
100% reference	100 ± 10%	94 ± 10%	84 ± 5%	64 ± 5%

#### RV5/RP board (CH-B)

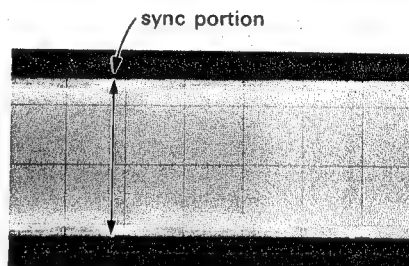
### 13-5-2. Y Record Current Adjustment

#### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; B/W signal
- Unsolder between TP5 and TP6/RP board (CH-A), and connect low resistor (1 to 5.1Ω) to unsoldered portion.
- Unsolder between TP8 and TP9/RP board (CH-B), and connect low resistor (1 to 5.1Ω) to unsoldered portion.
- Short between TP6 and GND/RP board with jumper. (CH-A)
- Short between TP9 and GND/RP board with jumper. (CH-B)

#### «spec.»

- TP5/RP board (GND ; TP6) or TP8/RP board (GND ; TP9)



$$\text{Sync Level} = \left( \begin{array}{l} 67 + 8\text{mA} \\ - 5\text{mA} \end{array} \right) \times R (\Omega)$$

$$\left( \begin{array}{l} \text{cf. } R = 2\Omega \quad 134 + 16\text{mV} \\ - 10\text{mV} \end{array} \right)$$

#### RV2/RP board



### 13-5-3. Chroma Record Current Adjustment

#### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; color bar
- Short between TP4 and E2/RP board with jumper.
- Unsolder between TP5 and TP6/RP board (CH-A), and connect low resistor (1 to 5.1Ω) to unsoldered portion.
- Unsolder between TP8 and TP9/RP board (CH-B), and connect low resistor (1 to 5.1Ω) to unsoldered portion.
- Short between TP6 and GND/RP board with jumper. (CH-A)
- Short between TP9 and GND/RP board with jumper. (CH-B)

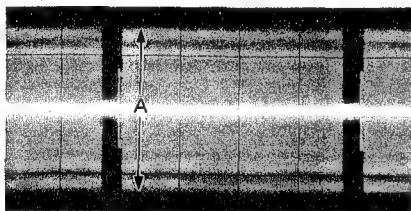
#### «how to adjustment»

- TP5/RP board (GND ; TP6) or TP8/RP board (GND ; TP9)
- Chroma Level =  $(15 \pm 5\text{mA}) \times R (\Omega)$   
(cf.  $R = 2\Omega$  30 ± 10mV)

● RV1/RP board

#### «spec.»

- Playback self-recorded portion, (After removing the short jumper of between TP4 and E2/RP board)
- TP1/CD board



TRIG ; TP5/CD board

- $A = 0.23 \pm 0.015\text{V}$   
- 0.04V

#### Reference

- Chroma Level > 0.23V ; Turn RV1 to clockwise.  
(adjust from soldering side)
- Chroma Level < 0.23V ; Turn RV1 to counterclockwise.  
(adjust from soldering side)

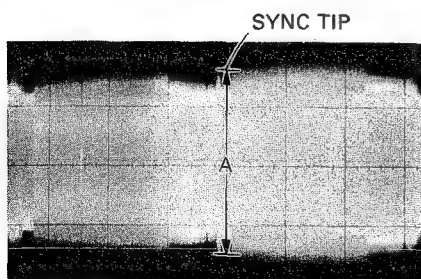
### 13-5-4. Y RF LEVEL Adjustment

#### «machine conditions for adjustment»

- Playback self-recorded portion.
- VIDEO IN ; color bar

#### «spec.»

- TP29/YD board



TRIG ; TP3/YD board

- $A = 0.34 \pm 0.04\text{V}$

● RV6/YD board (level)

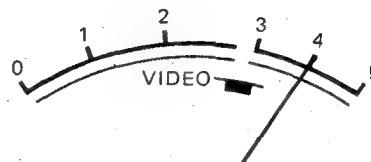
### 13-5-5. TRACKING METER Calibration

#### «machine conditions for adjustment»

- Playback self-recorded portion.
- VIDEO IN ; color bar
- TRACKING ; FIXED

#### «spec.»

- VIDEO/RF meter



- Set the scale 4.

● RV201/MD board

### 13-6. Y/C DELAY TIME ADJUSTMENT

#### 13-6-1. PB Delay Time Adjustment

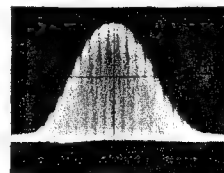
#### «machine conditions for adjustment»

- Playback mode ; Alignment tape  
(modulated 20T pulse segment)

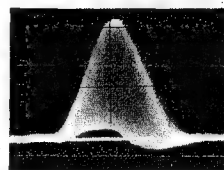
#### «spec.»

- VIDEO OUT

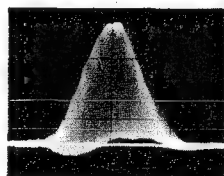
OK



Y progressed to C.



C progressed to Y.



- DL1/YD board
- CV1/CD board (fine adj.)



### 13-6-2. DUB Delay Time Adjustment

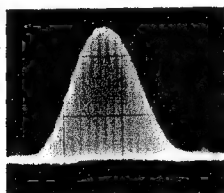
«machine conditions for adjustment»

- Playback mode ; Alignment tape (modulated 20T pulse segment)

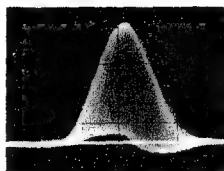
«spec.»

- DUB Y OUT (Scope CH-A)
- DUB C OUT (Scope CH-B)
- Oscilloscope ADD mode

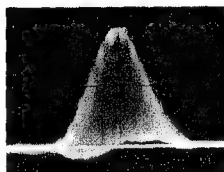
OK



Y progressed to C.



C progressed to Y.



- DL2/CD board
- CV2/CD board (fine adj.)

### 13-6-3. Record Delay Time Adjustment

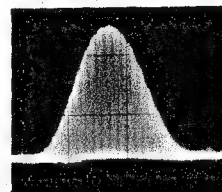
«machine conditions for adjustment»

- Playback self-recorded portion.
- VIDEO IN ; modulated 20T pulse

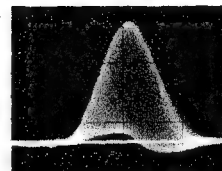
«spec.»

- VIDEO OUT

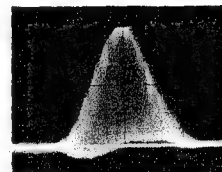
OK



Y progressed to C.



C progressed to Y.



- DL101/MD board
- CV102/MD board (fine adj.)



### 13-7. OVERALL FREQUENCY RESPONSE ADJUSTMENT

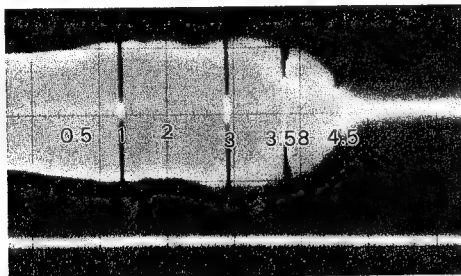
#### 13-7-1. B/W mode Y Playback Frequency Response Adjustment

«machine conditions for adjustment»

- Playback the self-recorded portion.
- VIDEO IN ; gated sweep (without burst)

«spec.»

- TP27/YD board



0.5MHz	1MHz	2MHz	3MHz	3.58MHz	4.5MHz
100% reference	100 ± 5%	100 ± 10%	100+10 -15%	95 ± 15%	65 ± 20%

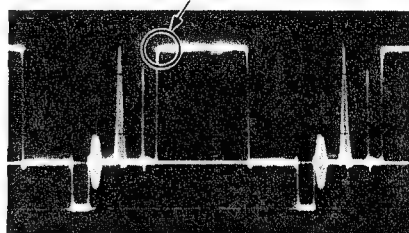
#### 13-7-3. Smear Compensator Adjustment

«machine conditions for adjustment»

- Playback self-recorded portion.
- VIDEO IN ; modulated 20T pulse

«spec.»

- VIDEO OUT



- Be almost right angle.

- RV5/MD board

- RV15/YD board

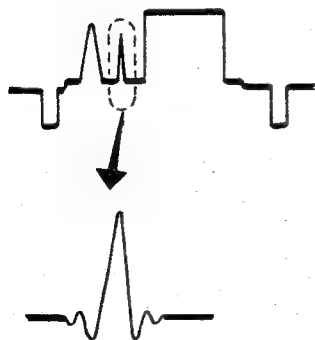
#### 13-7-2. Color mode Y Phase Equalizer Adjustment

«machine conditions for adjustment»

- Playback the self-recorded portion.
- VIDEO IN ; modulated 20T pulse
- VIDEO LEVEL SW ; MAN
- VIDEO LEVEL VR ; Adjust the level of VIDEO OUT (75Ω terminated) in EE mode is 0.8Vp-p.

«spec.»

- TP27/YD board



- Equalize the both levels, pre-shoot level and under-shoot level.

- RV11/YD board



## SECTION 14

### EDITING SYSTEM ALIGNMENT

#### [Equipment Required]

- Oscilloscope
  - Audio Oscillator
  - Audio Attenuator
  - Blank Tape
  - Alignment Tape
- RR5-1SB PAL (Parts No.8-960-020-61)

Time (min.)	Video	Audio	Time code
4	Color bars	3kHz,0dB	1 kHz
5	R-F sweep	—	—
5	Monoscope	—	—
2	Modulated 20T pulse	1kHz,0dB	—
2	R-F 8MHz	10kHz,-10dB	—

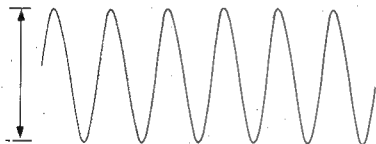
#### 14-1. ROTARY ERASE CURRENT ADJUSTMENT

##### «machine conditions for adjustment»

- VIDEO INSERT mode
- VIDEO IN ; color bar

##### «spec.»

- TP105/RP board (GND ; TP104/RP board) (CH-B)

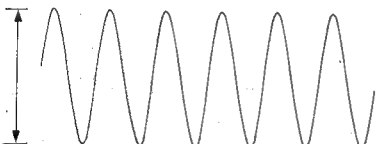


- $0.3 \pm 0.02V$

- RV101/RP board (CH-B)

##### «spec.»

- TP103/RP board (GND ; TP102/RP board) (CH-A)



- $0.3 \pm 0.02V$

- RV102/RP board (CH-A)

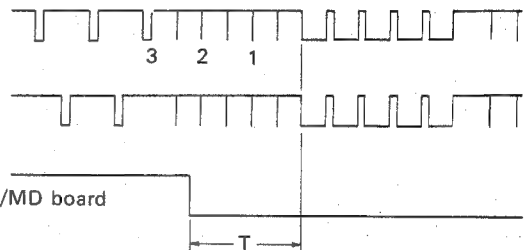
#### 14-2. CONF MODE SWITCHING PULSE ADJUSTMENT

##### «machine conditions for adjustment»

- REC mode
- VIDEO IN ; color bar
- PB/PB • EE SW ; PB

##### «spec.»

- VIDEO OUT



- 39B/MD board

- $T = 2.25 \pm 0.25H$

- RV504/MD board

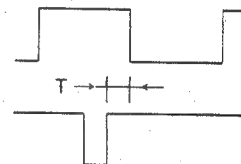
#### 14-3. RE GATE PULSE POSITION ADJUSTMENT

##### «machine conditions for adjustment»

- EE mode
- VIDEO IN ; color bar
- Short between 3B and 30B/MD board with jumper.

##### «spec.»

- 39B/MD board



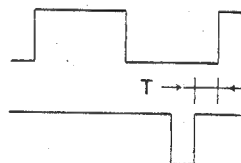
- TP504/MD board

- $T = 3 \pm 0.05mS$

- RV501/MD board (CH-A)

##### «spec.»

- 39B/MD board



- TP503/MD board

- $T = 3 \pm 0.05mS$

- RV502/MD board (CH-B)



#### 14-4. TIME CODE PLAYBACK/OUTPUT LEVEL ADJUSTMENT

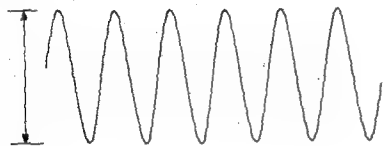
NOTE ; Applicable parts number 1-604-341-11 to -14.

«machine conditions for adjustment»

- Playback mode ; Alignment tape (time code segment)

«spec.»

- TP104/TC-13



- $1.5 \pm 0.1V$

RV102/TC-13 (Playback Level)

«spec.»

- TC OUT
- $0 \pm 0.5dB$

RV103/TC-13 (Output Level)

#### 14-4. TIME CODE PLAYBACK AMPLIFIER ADJUSTMENT

##### 14-4-1. Playback Amplifier Offset Adjustment

NOTE ; Applicable parts number 1-604-341-15 and later.

«machine conditions for adjustment»

- STOP mode

«spec.»

- TP105/TC-13
- $0 \pm 0.2V$

RV103/TC-13

#### 14-4-2. Time code Output Level Adjustment

NOTE ; Applicable parts number 1-604-341-15 and later.

«machine conditions for adjustment»

- Playback mode ; Alignment tape (time code segment)

«spec.»

- TC OUT
- $0 \pm 0.5dB$

RV102/TC-13

Reference ; The level at TC OUT is  $0 \pm 2dB$ .

#### 14-5. TIME CODE RECORD CURRENT ADJUSTMENT

«machine conditions for adjustment»

- Playback the self-recorded portion.
- VIDEO IN ; color bar
- TC IN ; rectangular wave (sine wave), 1.2kHz, 0dB

«spec.»

- TP104/TC-13



- $1.9 \pm 0.1V$

RV101/TC-13

Reference

Time code level  $< 1.9V$  ; Turn the RV101 to counterclockwise.  
(adjust from the component side)

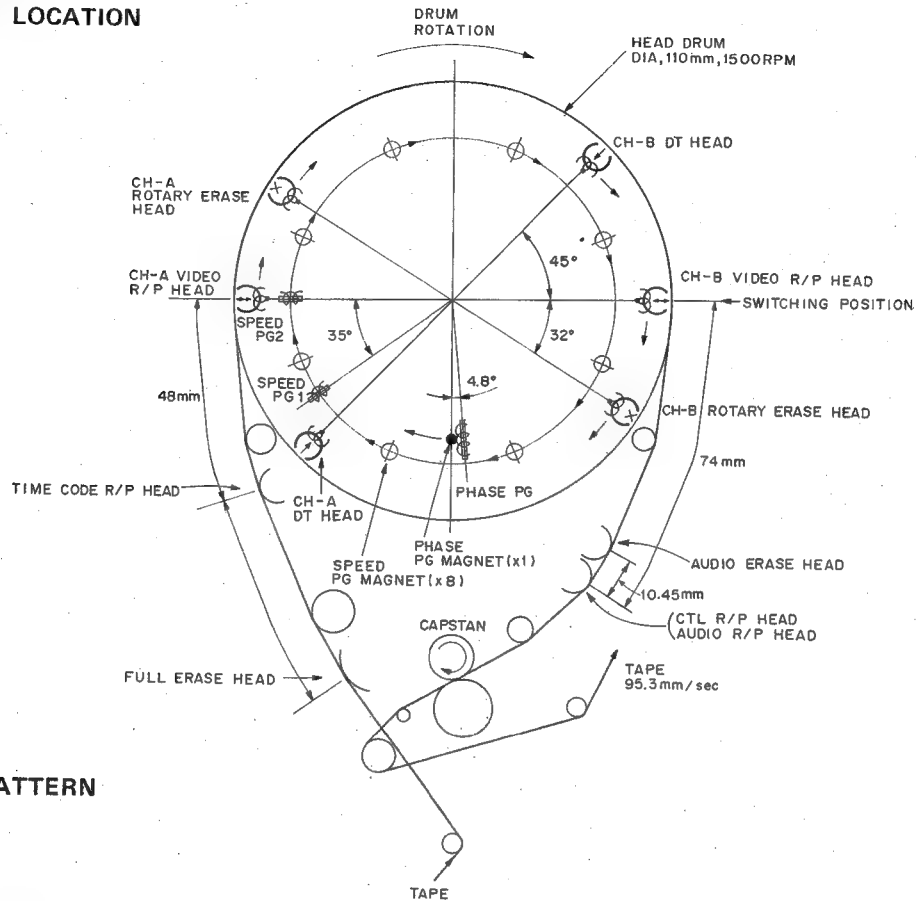
Time code level  $> 1.9V$  ; Turn the RV101 to clockwise.  
(adjust from the component side)



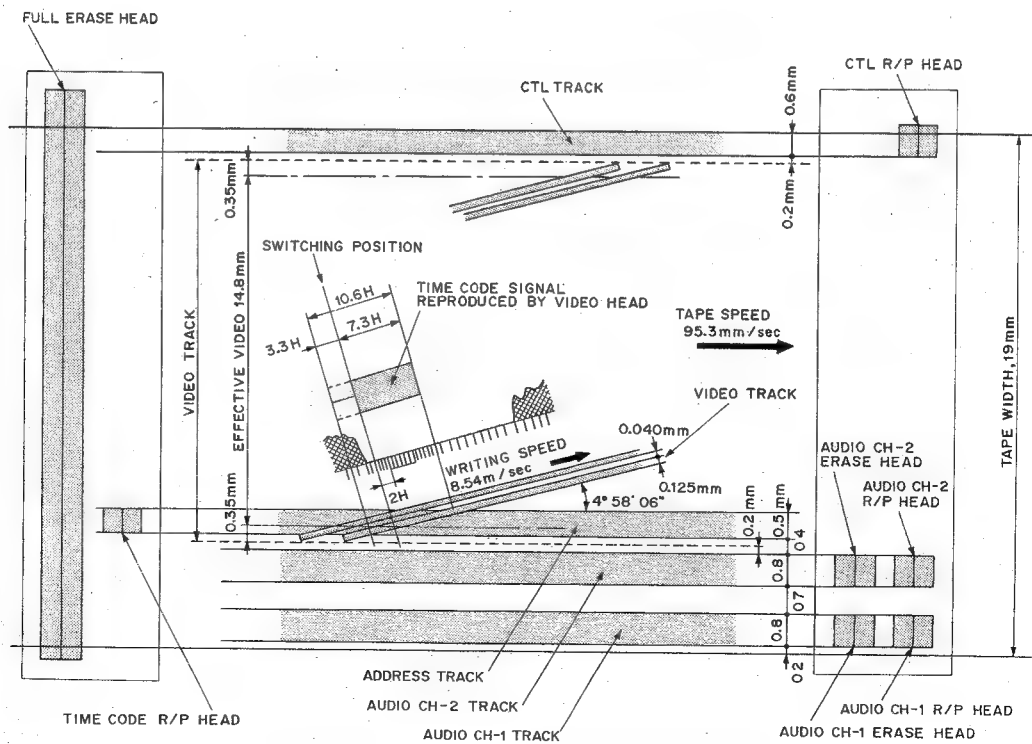
## SECTION 15 BLOCK DIAGRAM

### 15-1. TAPE FORMAT

#### 15-1-1. HEADS LOCATION

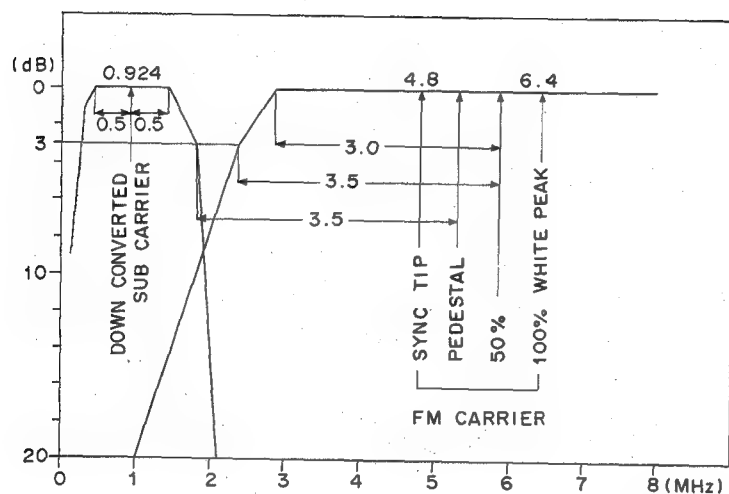


#### 15-1-2. TAPE PATTERN





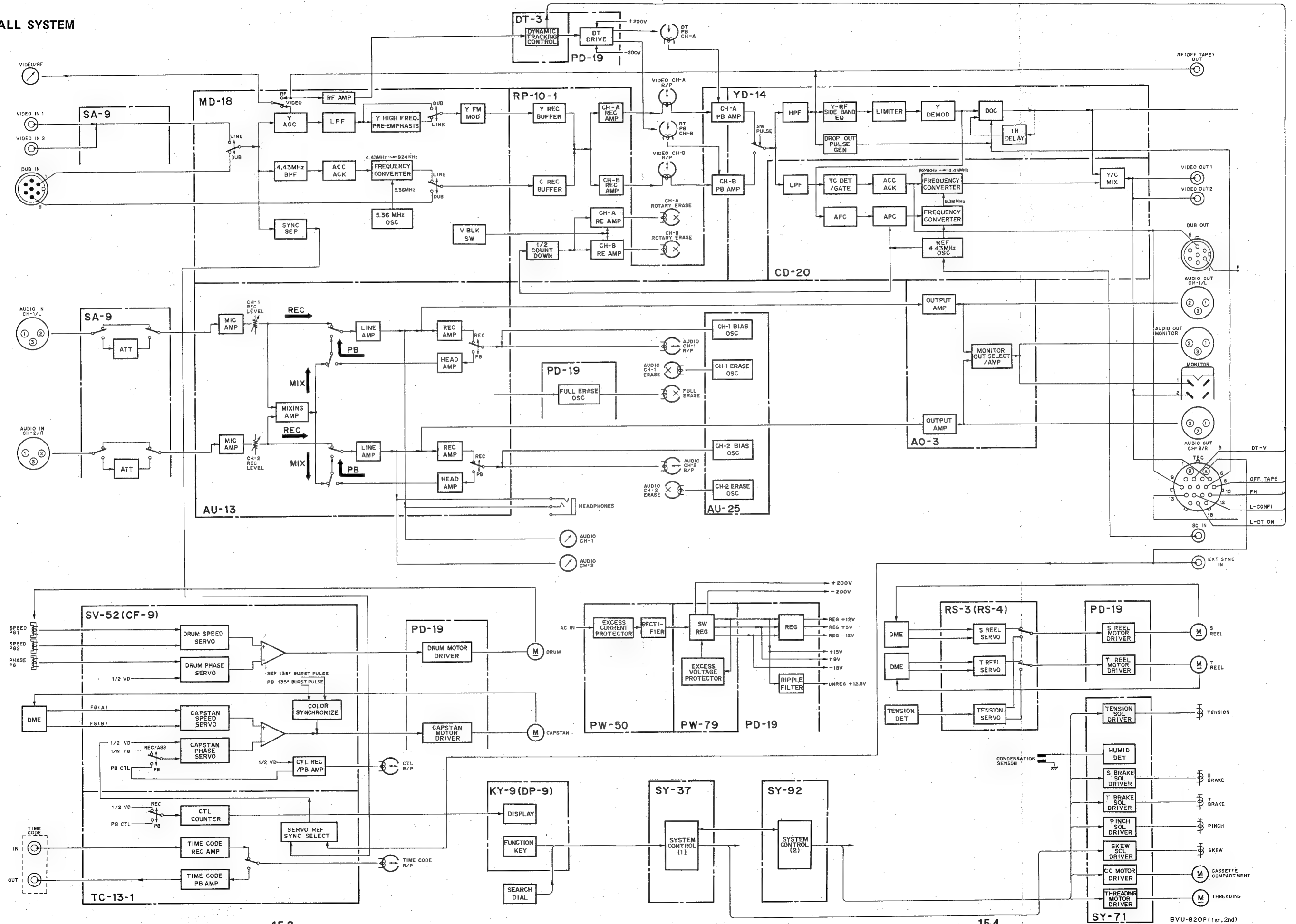
# 15-2. FREQUENCY ALLOCATION





# OVERALL SYSTEM

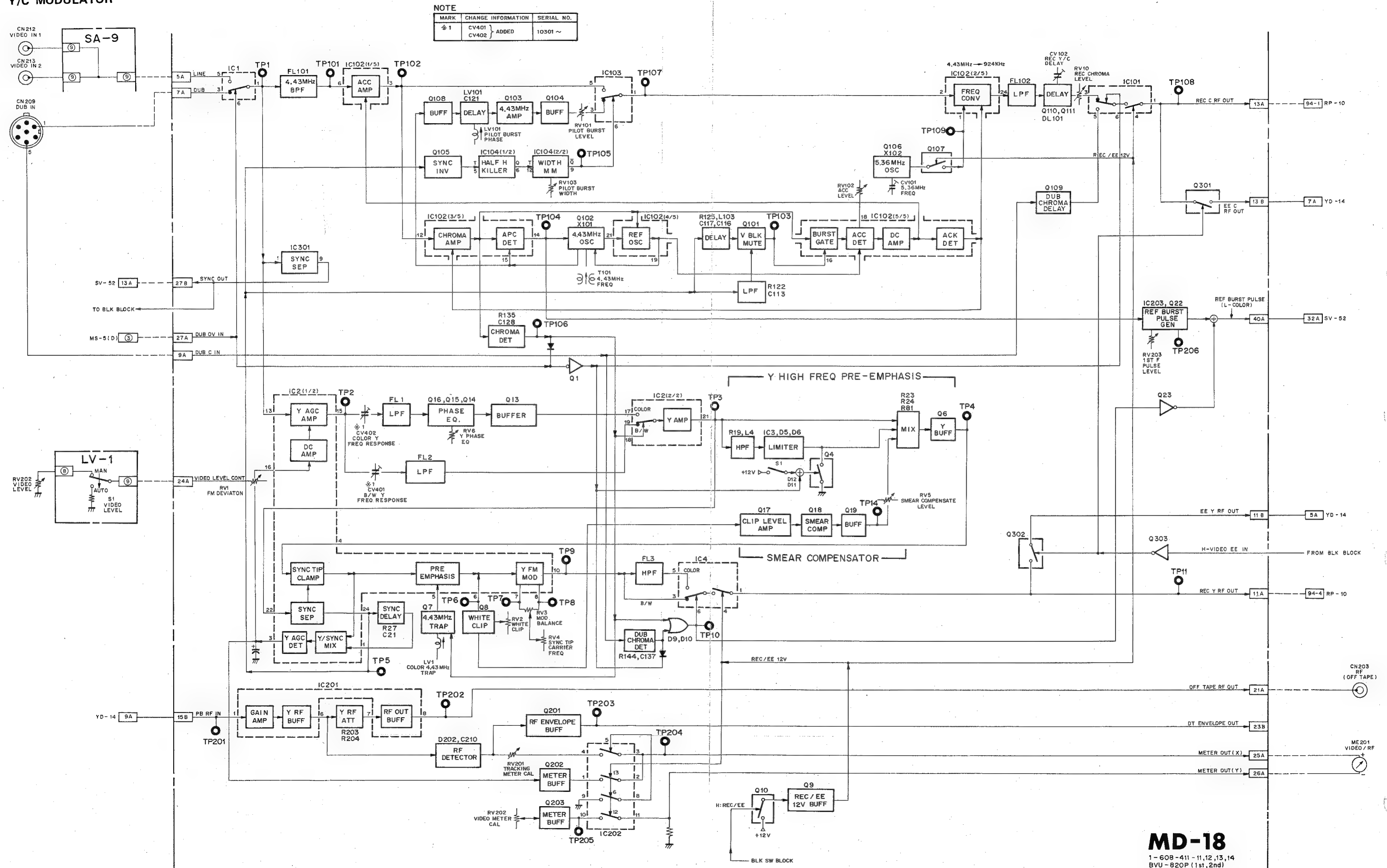
## OVERALL OVERALL





Y/C MOD	Y/C MOD
---------	---------

## Y/C MODULATOR

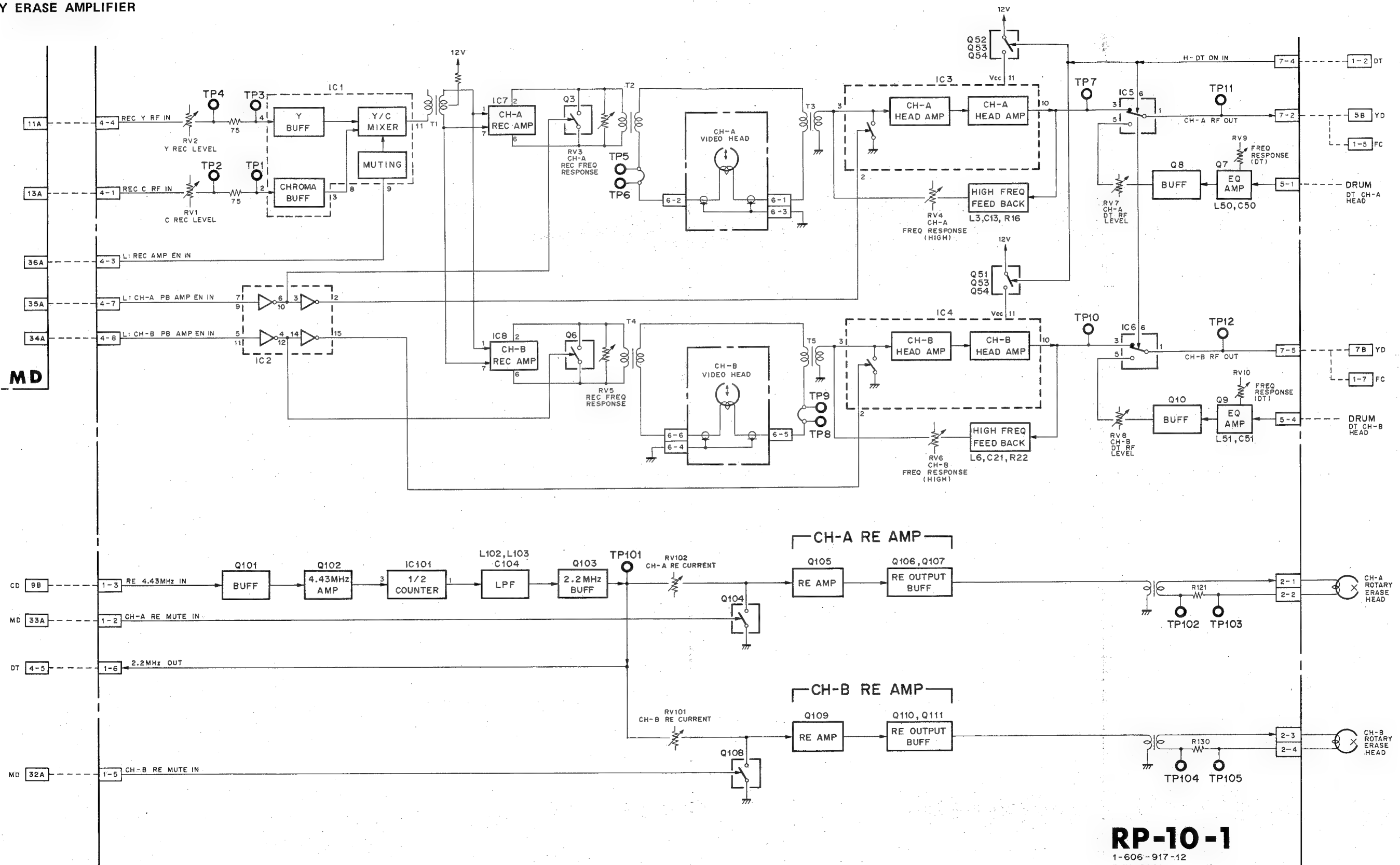


**MD-18**  
1-608-411-11,12,13,14  
BVU-820P (1st,2nd)



# Y/C REC PB AMP / RE AMP    Y/C REC PB AMP / RE AMP

## Y/C REC PB AMPLIFIER ROTARY ERASE AMPLIFIER



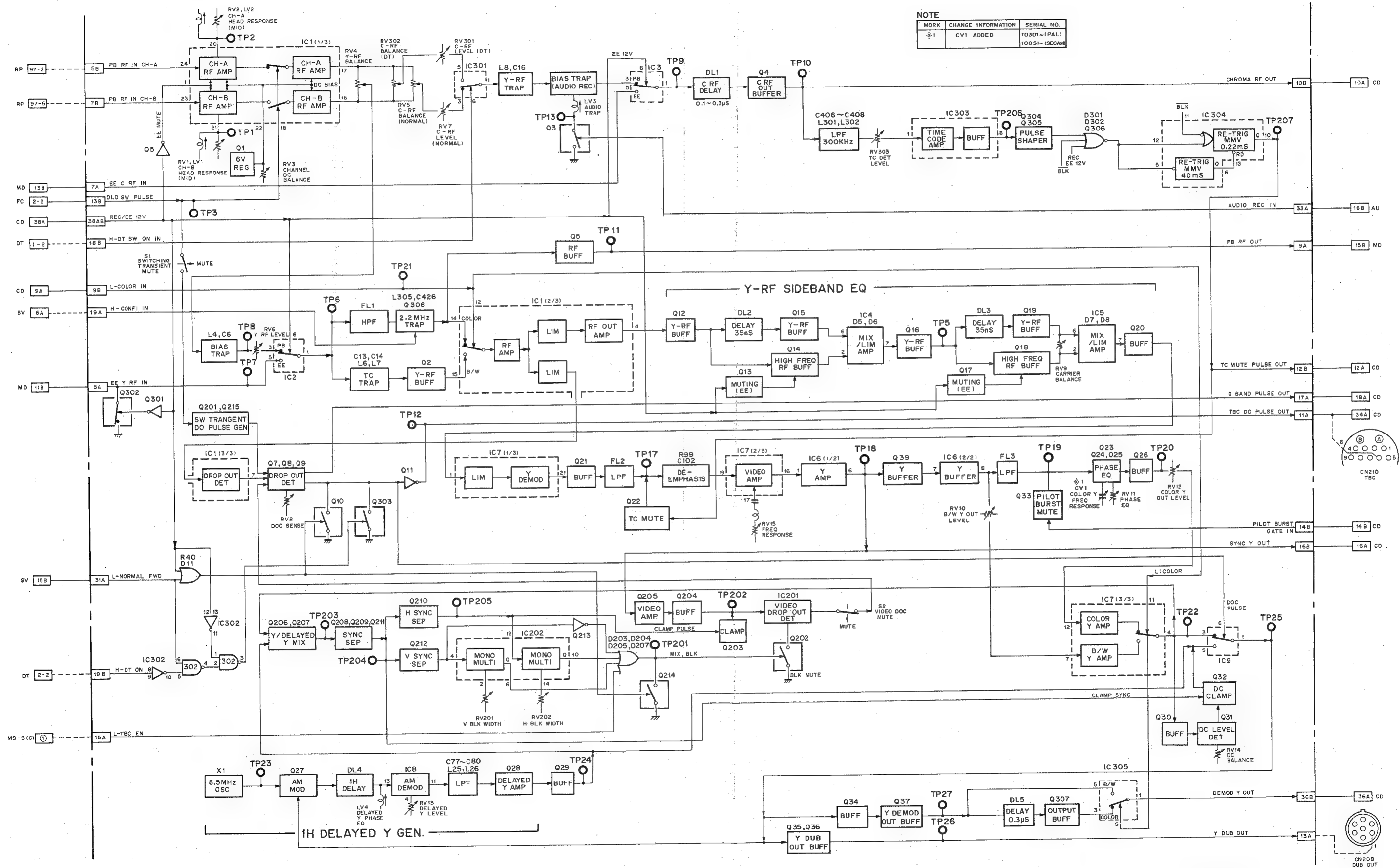
**RP-10-1**

1-606-917-12  
BVU-820P (1st, 2nd)  
BVU-820S (1st)



# Y DEMOD Y DEMOD

## Y DEMODULATOR

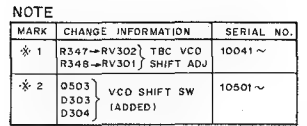




## CHROMA DEMODULATOR

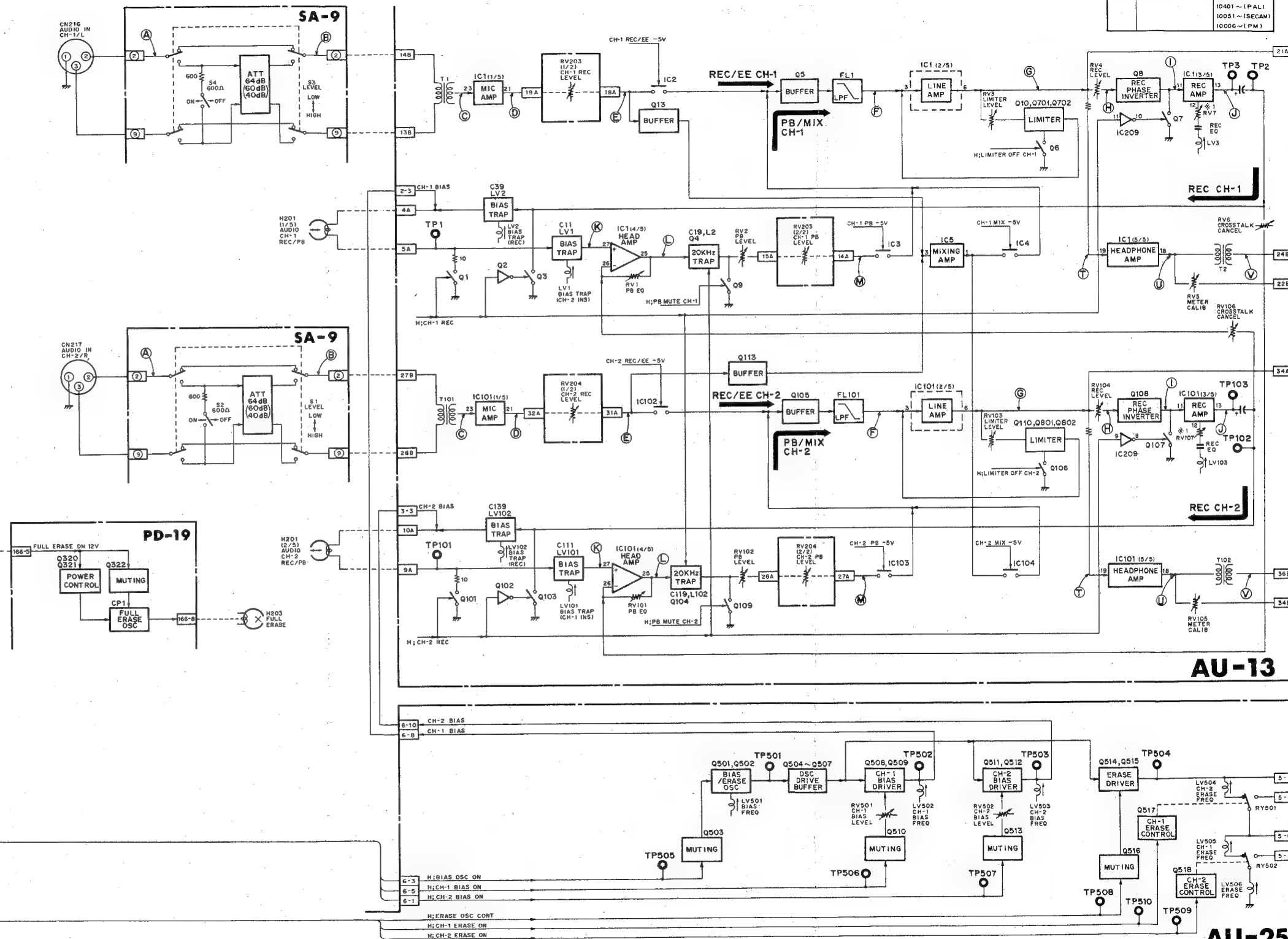
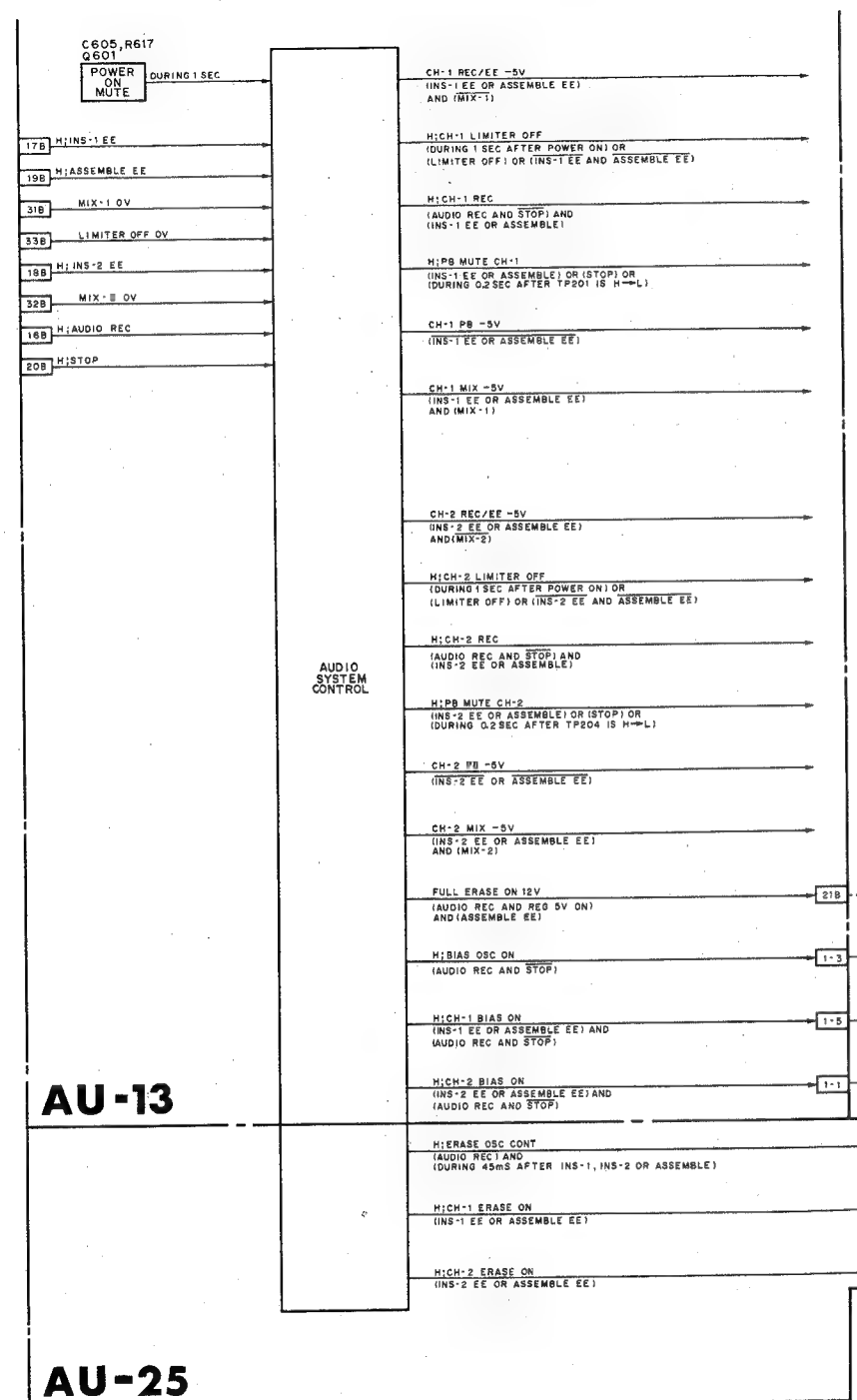






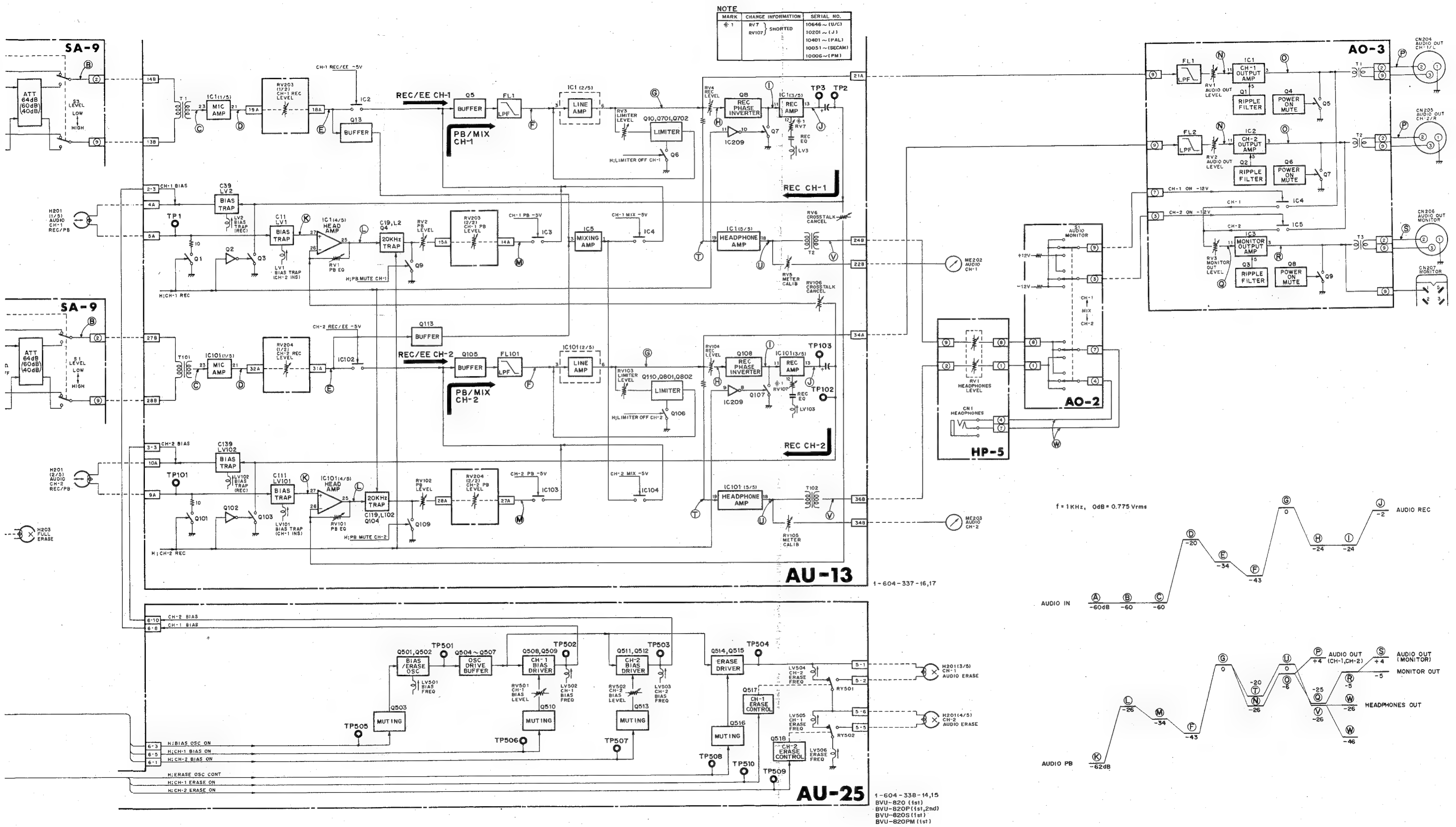


AUDIO SYSTEM



MARK	CHANGE INFORMATION	SERIAL NO.
1	RV7, RV107 SHORTED	10646~(1/2)
		10201~(J)
		10401~(PAL)
		10051~(SECAM)
		10006~(PM)





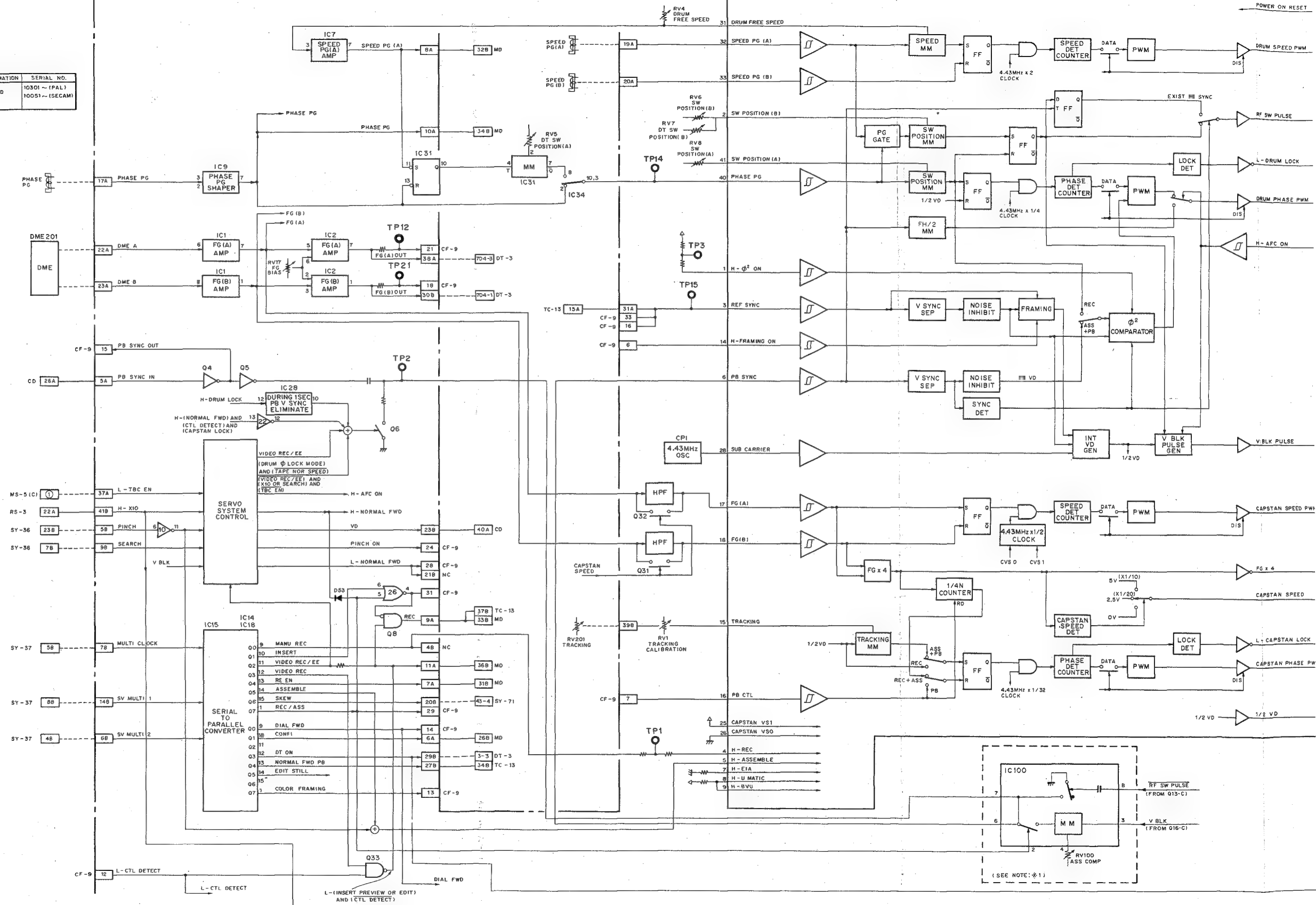


# DRUM/CAPSTAN SERVO

DRUM SERVO  
CAPSTAN SERVO

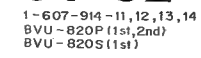
NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
1	IC100 RV100	ADDED
		10301~(PAL) 10051~(SECAM)





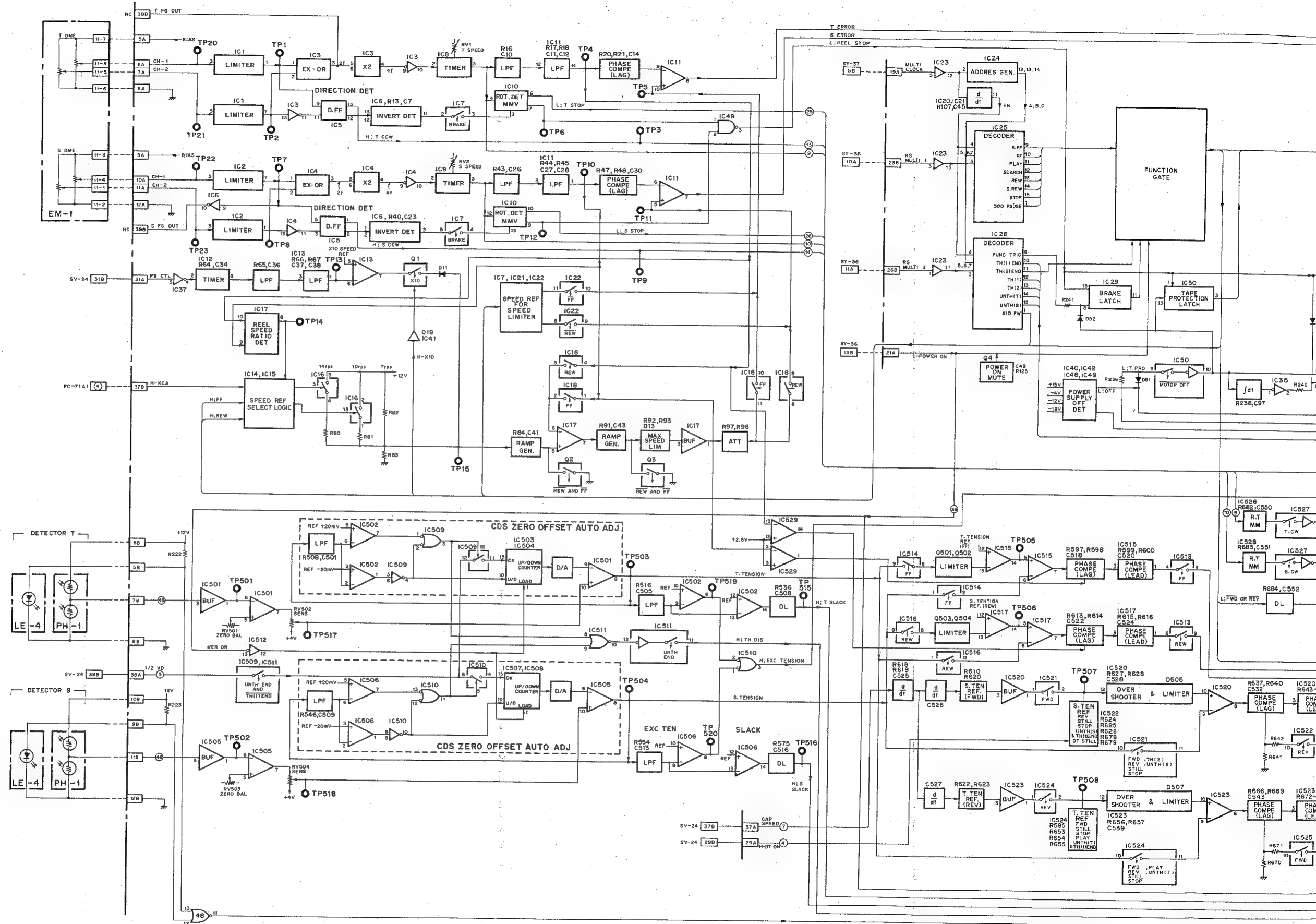
## DRUM/CAPSTAN SERVO





# REEL/TAPE TENSION SERVO

REEL SERVO  
TAPE TENSION SERVO





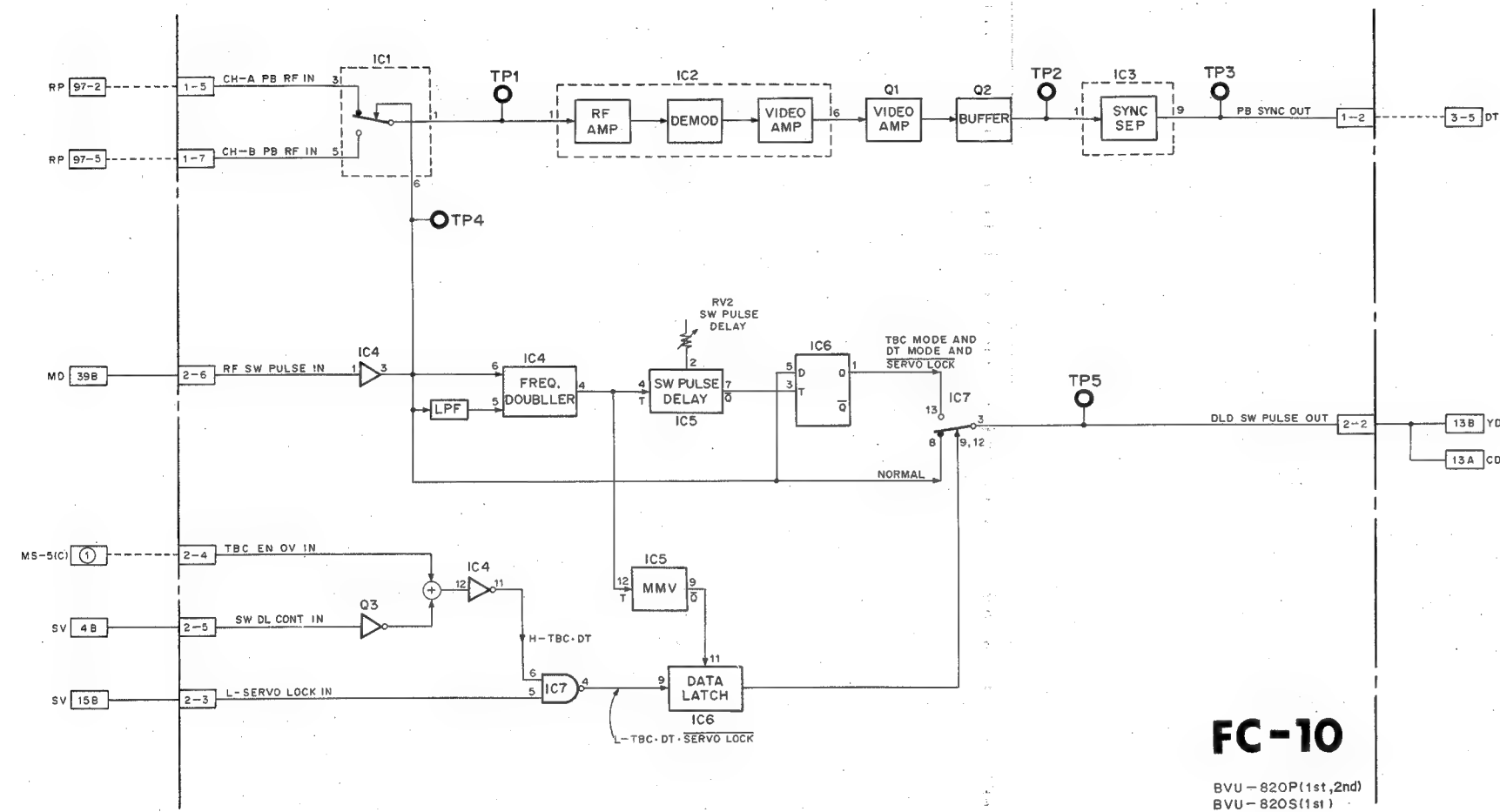
## REEL/TAPE TENSION SERVO





# SW PULSE DELAY SW PULSE DELAY

## SWITCHING PULSE DELAY (IN TBC AND DT)









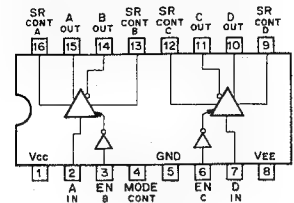
# SECTION 16 SEMICONDUCTOR ELECTRODES

TYPE	INTERCHANGEABILITY					PAGE
AM26LS30PC AM26LS31PC AM26LS32PC BX343 BX350 BX373 BX375 BX388 BX389 BX3914 BX3915 BX3944	BX373A          BX3915A					16-3
CD4001BE CD4009UBE CD4011BE CD4012BE CD4013BE CD4015BE CD4018BE CD4020BE CD4023BE CD4024BE CD4025BE CD4027BE CD4029BE CD4030BE CD4040BE CD4043BE CD4046BE CD4051BE	TC4001BP TC4009UBP TC4011BP TC4012BP TC4013BP TC4015BP TC4018BP TC4020BP TC4023BP TC4024BP TC4025BP TC4027BP TC4029BP TC4030BP TC4040BP TC4043BP TC4051BP	HD14001BP  HD14011BP	μPD4001C  μPD4011C  μPD4013C	MB84001B  MB84011B  MB84013B	MC14001BCP	16-4
CD4052BE CD4053BE CD4066BE CD4068BE CD4069UBE CD4071BE CD4072BE CD4073BE CD4075BE	TC4052BP TC4053BP TC4066BP TC4068BP TC4069UBP TC4071BP TC4072BP TC4073BP TC4075BP		μPD4023C μPD4024BC  μPD4027C μPD4029BC	MB84027B	MSM4024RS   MSM4029RS	16-5
CD4077BE CD4078BE CD4081BE CD4082BE CD4085BE CD4093BE CD4099BE CD40161BE	TC4078BP TC4081BP TC4082BP TC4085BP TC4093BP TC4099BP TC40161BP	HD14051BP	μPD4051BC		MC14046BCP MSM4051RS	16-6
CX130 CX131A CX133A CX134A CX135 CX170 CX188 CX756A CX757		HD14066BP  HD14069UBP	μPD4069C	MB84053B  MB84069B		16-7
						16-8
						16-9

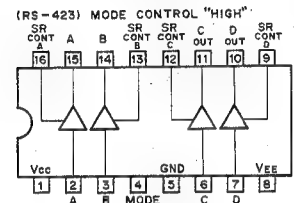
TYPE	INTERCHANGEABILITY					PAGE
CX859 CX872 HA1807 LB1264 LM324 LM339 M54517P	NJM2902N	HA17902P	μPC324C μPC339C			16-10
M54519P M54529P MB8532 MC14174BCP MC14510BCP MC14512BCP MC14516BCP	TC40174BP TC4510BP TC4512BP TC4516BP		μPD4512C μPD4516C			16-11
MC14519BCP MC14520BCP MC14528BCP MC14538BCP MC14539BCP MC14584BCP	— TC4520BP TC4528BP — TC4539BP	HD14538BP	μPD4519C  μPD4539C			16-12
MC14585BCP MC14598BCP NE555N NJM2901N NJM2903D NJM4562D RC4558 SN74LS05N	TC4585BP M51841P					16-13
SN7407N SN74LS32N SN74LS74AN SN16913P SN74LS138N SN74LS139N SN74LS156N SN74LS158N	μPC4558C	NJM4558D	μPC1458C			16-14
SN74LS244N SN74LS377N SN74LS378N SN74LS379N TA7060AP TA7069P TA7076P TA7617AP						16-15
TC5067BP TC40H074P TC40H368P TL082CP TL191CN μA7800UC μA7900UC μPA54H μPA64H μPC311C μPD444C μPA76V-FA	μPC14300H	μPC7800H				16-16
						16-17



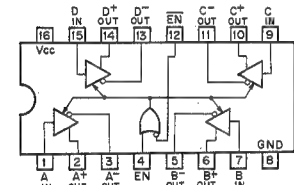
AM26LS30PC (ADVANCED MICRO DEVICE)  
DIFFERENTIAL RS-422 PARTY LINE/SINGLE ENDED RS-423 LINE DRIVER  
(RS-422) MODE CONTROL "LOW"



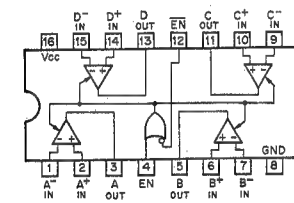
SR CONT: SLEW RATE CONTROL



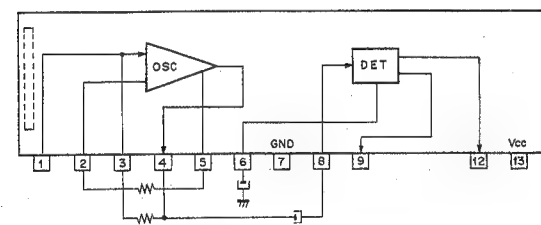
AM26LS31PC (ADVANCED MICRO DEVICE)  
HIGH SPEED DIFFERENTIAL LINE DRIVER  
-TOP VIEW-



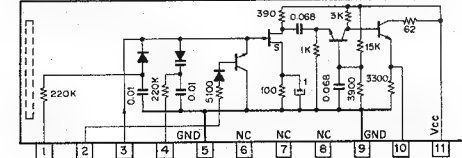
AM26LS32PC (ADVANCED MICRO DEVICE)  
HIGH SPEED DIFFERENTIAL LINE RECEIVER  
-TOP VIEW-



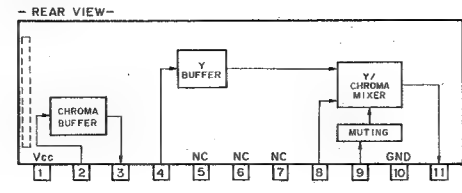
BX343 (SONY)  
OSCILLATOR/DETECTOR  
-REAR VIEW-



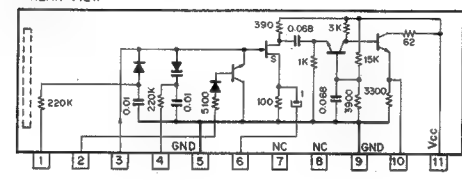
BX350 (SONY)  
VIDEO HEAD AMP/MUTING  
-REAR VIEW-



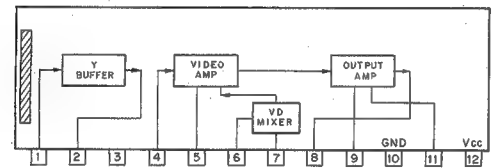
BX373 (SONY)  
BX373A (SONY)  
MIX AMP  
-REAR VIEW-



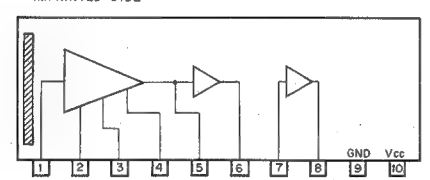
BX375 (SONY)  
VIDEO HEAD AMP/MUTING  
-REAR VIEW-



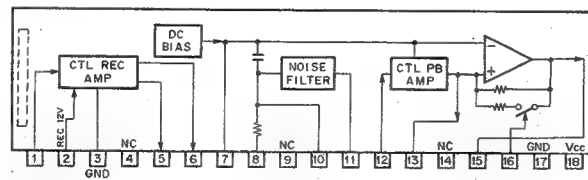
BX388 (SONY)  
VIDEO AMP/VD MIXER  
-IMPRINTED SIDE-



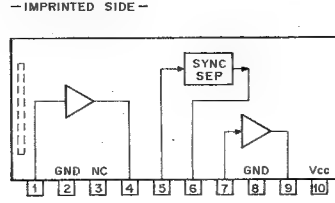
BX389 (SONY)  
VIDEO AMPLIFIER  
-IMPRINTED SIDE-



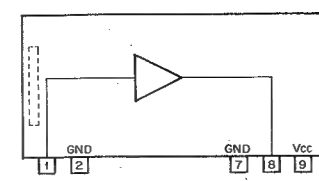
BX3914 (SONY)  
CTL REC/PB AMPLIFIER  
-IMPRINTED SIDE-



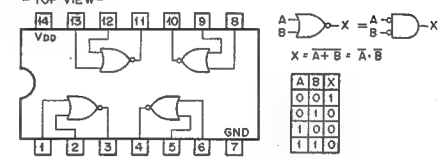
BX3915 (SONY)  
BX3915A (SONY)  
SYNC SEPARATOR  
-IMPRINTED SIDE-



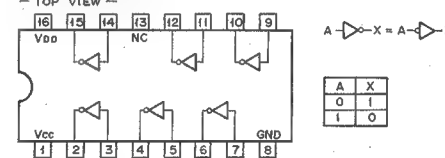
BX3944 (SONY)  
VIDEO HEAD AMPLIFIER  
-REAR VIEW-



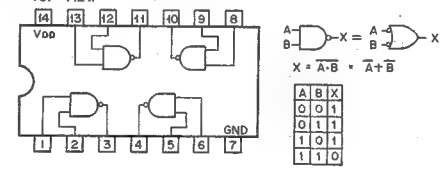
CD4001AE/BE (RCA)  
TC4001BP (TOSHIBA)  
HD14001BP (HITACHI)  
MB84001B (FUJITSU)  
μPD4001C (NEC)  
MC14001BCP (MOTOROLA)  
C-MOS 2-INPUT NOR GATE  
-TOP VIEW-



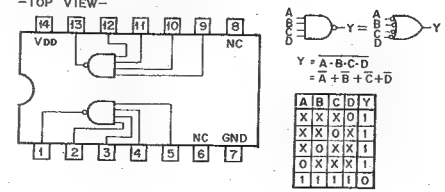
CD4009UBE (RCA)  
TC4009UBP (TOSHIBA)  
C-MOS INVERTING TYPE BUFFER/CONVERTER  
(TO TTL LEVEL)  
-TOP VIEW-



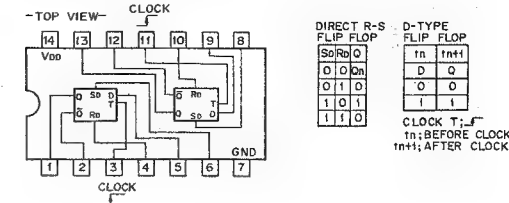
CD4011AE/BE (RCA)  
TC4011BP (TOSHIBA)  
HD14011BP (HITACHI)  
MB84011B (FUJITSU)  
μPD4011C (NEC)  
C-MOS 2-INPUT NAND GATE  
-TOP VIEW-



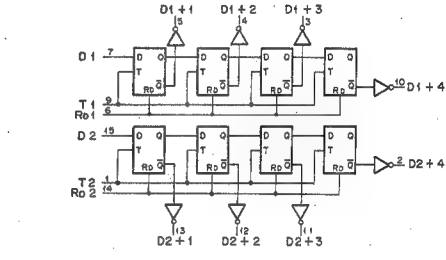
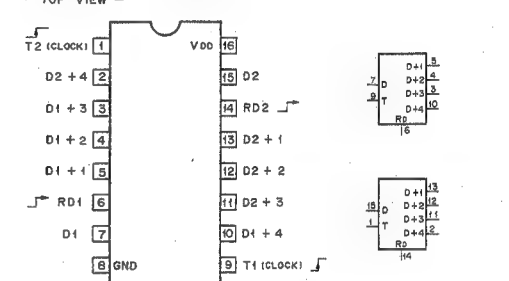
CD4012AE/BE (RCA)  
TC4012BP (TOSHIBA)  
C-MOS 4-INPUT NAND GATE  
-TOP VIEW-



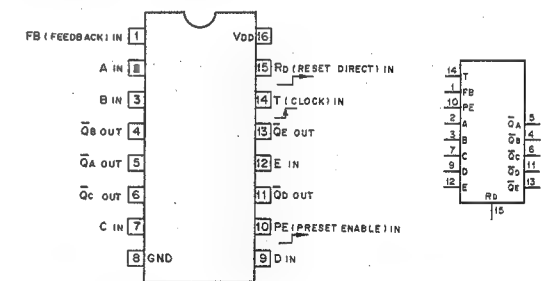
CD4013AE/BE (RCA)  
TC4013BP (TOSHIBA)  
MB84013B (FUJITSU)  
μPD4013C (NEC)  
C-MOS D-TYPE FLIP FLOP WITH DIRECT SET/RESET  
-TOP VIEW-



CD4015AE/BE (RCA)  
TC4015BP (TOSHIBA)  
C-MOS DUAL 4-STAGE STATIC SHIFT REGISTER WITH DIRECT RESET  
-TOP VIEW-



CD4018AE/BE (RCA)  
TC4018BP (TOSHIBA)  
C-MOS PRESETTABLE DIVIDE-BY-N COUNTER  
-TOP VIEW-



DIVIDE BY	CONNECT TO FB INPUT	VIA	RESULTS FROM EACH Q OUTPUT
10	Q <sub>A</sub>	DIRECT	5 COUNTS HIGH, 5 COUNTS LOW
9	Q <sub>B</sub> , Q <sub>E</sub>	AND GATE	5 COUNTS HIGH, 4 COUNTS LOW
8	Q <sub>B</sub>	DIRECT	4 COUNTS HIGH, 4 COUNTS LOW
7	Q <sub>C</sub> , Q <sub>D</sub>	AND GATE	4 COUNTS HIGH, 3 COUNTS LOW
6	Q <sub>C</sub>	DIRECT	3 COUNTS HIGH, 3 COUNTS LOW
5	Q <sub>A</sub> , Q <sub>C</sub>	AND GATE	3 COUNTS HIGH, 2 COUNTS LOW
4	Q <sub>B</sub>	DIRECT	2 COUNTS HIGH, 2 COUNTS LOW
3	Q <sub>A</sub> , Q <sub>B</sub>	AND GATE	2 COUNTS HIGH, 1 COUNTS LOW
2	Q <sub>A</sub>	DIRECT	1 COUNTS HIGH, 1 COUNTS LOW



Pinout diagram for the 74VHC04 hex inverters. The diagram shows two 14-pin DIP packages. The left package has pins 1 through 8 on the left and 16 through 9 on the right. Pin 1 is labeled Q11, pin 2 is Q12, pin 3 is Q13, pin 4 is Q5, pin 5 is Q4, pin 6 is Q6, pin 7 is Q3, and pin 8 is GND. Pin 16 is VDD, pin 15 is Q10, pin 14 is Q9, pin 13 is Q7, pin 12 is Q8, pin 11 is Rd, and pin 10 is T. The right package has pins 11 through 13 on the left and 0 through 3 on the right. Pin 11 is 15C, pin 12 is T, pin 13 is 15C, pin 0 is 00, pin 1 is 01, pin 2 is 02, and pin 3 is 03.

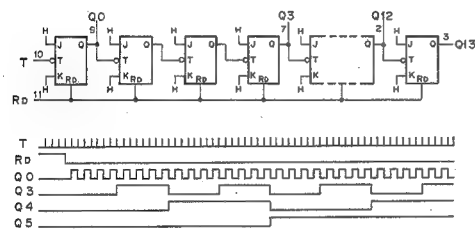


Figure 1 shows a logic circuit for a 3-input OR gate. The circuit uses three 2-input OR gates. The inputs are labeled 1, 2, and 3 at the bottom. The outputs of the first two 2-input OR gates are labeled 4 and 5. The final output is labeled 7. The circuit is powered by VDD at the top and GND at the bottom. To the right of the circuit is a truth table for the 3-input OR gate.

A	B	C	Y
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

The diagram shows a timing sequence for a J-K flip-flop. The top horizontal axis is labeled 'CLOCK' and has pins 16, 15, 14, 13, 12, 11, 10, and 9 marked. The bottom horizontal axis is labeled 'CLOCK' and has pins 1, 2, 3, 4, 5, 6, 7, and 8 marked. A vertical line labeled 'V<sub>cc</sub>' is on the left, and a vertical line labeled 'GND' is on the right. The circuit diagram shows a J-K flip-flop with inputs J (pin 1), K (pin 2), and clock (pin 3). The outputs are Q (pin 4) and Q-bar (pin 5). The direct R-S flip-flop has inputs R (pin 10) and S (pin 11) and outputs Q (pin 12) and Q-bar (pin 13). The timing diagram shows that the J-K flip-flop output changes only on the rising edge of the clock, while the direct R-S flip-flop output changes immediately when its inputs are asserted.

Figure 1 shows a logic circuit for a 74181 ALU. The circuit has 17 pins: 14 (VDD), 13, 12, 11, 10, 9, 8, 1, 2, 3, 4, 5, 6, 16 (GND), and 17. It contains three 3-input AND gates and one 3-input OR gate. The AND gates are connected to pins 13, 12, 11; 10, 9, 8; and 1, 2, 3. The OR gate is connected to pins 4, 5, 6. The output of the OR gate is pin 17. The circuit implements the logic function  $Y = A \cdot B \cdot C = \bar{A} + \bar{B} + \bar{C}$ . To the right of the circuit is a truth table for the function Y.

A	B	C	Y
X	X	0	1
X	0	X	1
0	X	X	1
1	1	1	0

COUNT	INPUTS	OUTPUTS							
	X	Rd	Q7	Q6	Q5	Q4	Q3	Q2	Q1
0	X	1	0	0	0	0	0	0	0
1	L	0	0	0	0	0	0	0	1
2	L	0	0	0	0	0	0	1	0
3	L	0	0	0	0	0	0	1	1
4	L	0	0	0	0	0	1	0	0
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
125	L	0	1	1	1	1	1	0	1
126	L	0	1	1	1	1	1	1	0
127	L	0	1	1	1	1	1	1	1
—	0	0	NO CHANGE						
—	1	0							

Pin diagram of the 74VHC00 14-pin DIP package. The package is shown with pins 1 through 14. Pin 1 is PE/PRESET ENABLE (I/N) with a pull-up resistor symbol. Pin 2 is QD OUT. Pin 3 is D IN. Pin 4 is A IN. Pin 5 is CE (CLOCK-ENABLE) (I/N) with a pull-up resistor symbol. Pin 6 is QA OUT. Pin 7 is CO (CARRY-OUT). Pin 8 is GND. Pin 9 is B/D (BINARY / DECADE) (I/N). Pin 10 is U/D (UP/DOWN) (I/N). Pin 11 is QB OUT. Pin 12 is B IN. Pin 13 is C IN. Pin 14 is QC OUT. Pin 15 is TCLOCK (I/N) with a pull-up resistor symbol. Pin 16 is VDD. To the right, a 16-pin package is shown with pins 1 through 16. Pins 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 are labeled with various functions: 1 PE, 2 A, 3 B, 4 C, 5 D, 6 CE, 7 T, 8 B/D, 9 QA, 10 QB, 11 QC, 12 CO, 13 D, 14 C, 15 B, 16 A.

INPUTS				MODE
CE	PE	U/D	B/D	
0	0	1	X	UP COUNT
0	0	0	X	DOWN COUNT
X	1	X	X	PRESET
1	0	X	X	NO COUNT
0	0	X	1	BINARY COUNT
0	0	X	0	DECADE COUNT

STATE	OUTBITS					
	CLOCK		UP		DOWN	
0	0	0	0	1	0	1
1	0	0	1	1	1	1
2	0	0	1	1	1	1
3	0	0	1	1	1	1
4	0	1	0	1	1	1
5	0	1	0	1	1	1
6	0	1	0	1	1	1
7	0	1	1	1	1	1
8	1	0	0	1	1	1
9	1	0	0	1	1	1
10	1	0	0	1	1	1
11	1	0	1	1	1	1
12	1	1	0	0	1	1
13	1	1	0	1	1	1
14	1	1	1	0	1	1
15	1	1	1	0	1	1

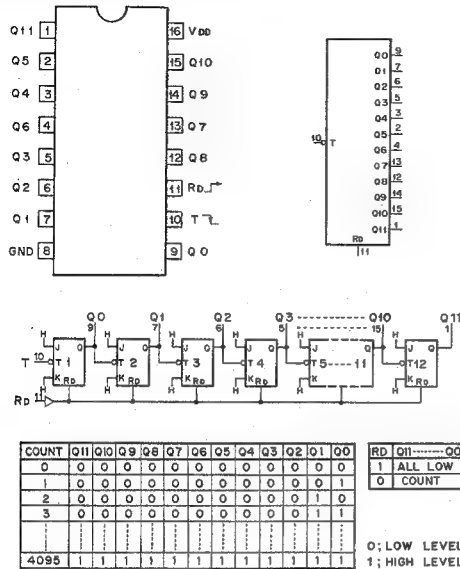
BINARY COUNTER

NOTE; CO IS HIGH WHEN CE IS HIGH, REGARDLESS OTHER CONDITIONS

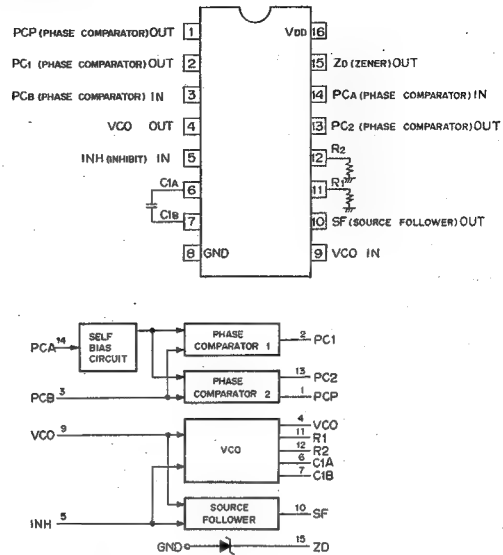
Figure 1 shows a logic circuit diagram for a 2-bit adder. The circuit has two 4-bit inputs, A (pins 14, 13, 12, 11) and B (pins 10, 9, 8, 7), and a carry-in input C (pin 1). The outputs are a 4-bit sum S (pins 1, 2, 3, 4) and a carry-out X (pin 5). The circuit uses two 74181 4-bit ALUs. The first ALU takes inputs A, B, and C, and produces the sum S. The second ALU takes inputs A and B, and produces the carry-out X. The logic is implemented using two 74181 chips, each configured as a 4-bit ALU. The first chip's inputs are A, B, and C, and its output is S. The second chip's inputs are A and B, and its output is X.



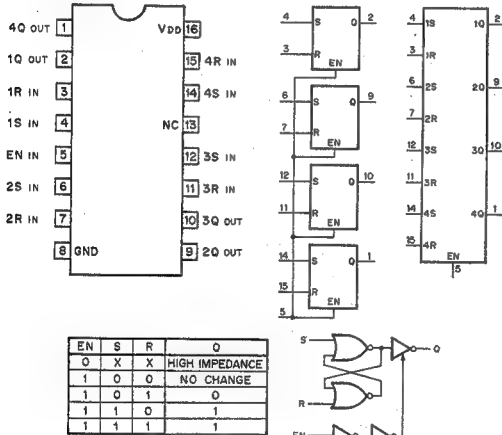
CD4040AE/BE (RCA)  
TC4040BP (TOSHIBA)  
C-MOS 12-STAGE RIPPLE CARRY BINARY COUNTER/DRIVER  
— TOP VIEW —



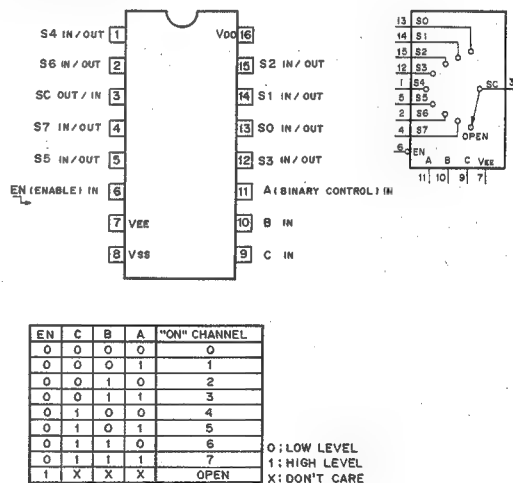
CD4046AE/BE (RCA)  
MC14046BCP (MOTOROLA)  
C-MOS PHASE LOCKED LOOP  
— TOP VIEW —



CD4043BE (RCA)  
TC4043BP (TOSHIBA)  
C-MOS POSITIVE NOR R/S FLIP-FLOP  
— TOP VIEW —



CD4051BE (RCA)  
HD14051BP (HITACHI)  
TC4051BP (TOSHIBA)  
μPD4051BC (NEC)  
MSM4051RS (OKI)  
C-MOS 8-CHANNEL MULTIPLEXER/DEMULTIPLEXER  
— TOP VIEW —

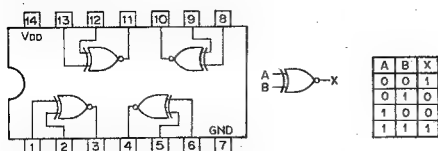




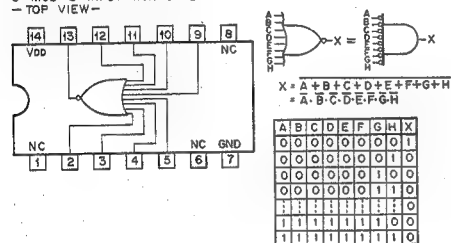




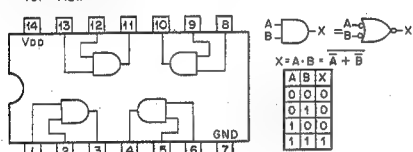
CD4077BE (RCA)  
MB84077B (FUJITSU)  
MC14077BCP (MOTOROLA)  
C-MOS EXCLUSIVE NOR GATE  
—TOP VIEW—



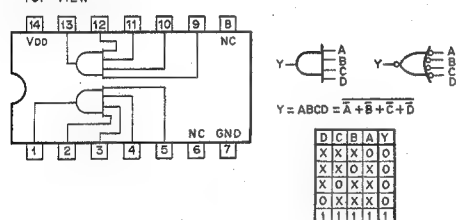
CD4078BE (RCA)  
TC4078BP (TOSHIBA)  
 $\mu$ PD4078C (NEC)  
C-MOS 8-INPUT NOR GATE  
—TOP VIEW—



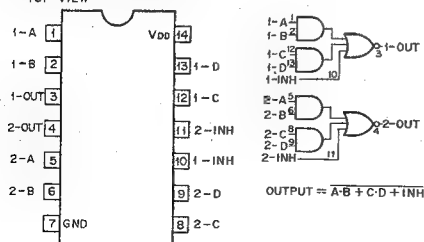
CD4081BE (RCA)  
TC4081BP (TOSHIBA)  
HD14081BP (HITACHI)  
MB84081B (FUJITSU)  
 $\mu$ PD4081C (NEC)  
C-MOS 2-INPUT AND GATE  
—TOP VIEW—



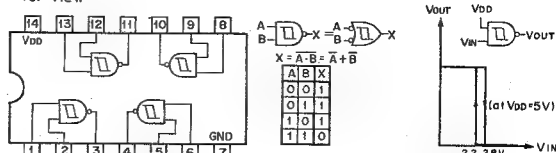
CD4082BE (RCA)  
TC4082BP (TOSHIBA)  
C-MOS 4-INPUT AND GATE  
—TOP VIEW—



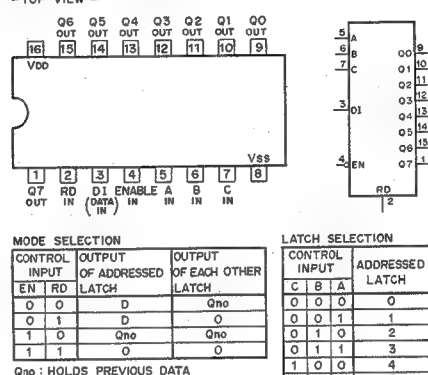
CD4085BE (RCA)  
TC4085BP (TOSHIBA)  
C-MOS DUAL 2-WIDE 2-INPUT AND-OR-INVERT GATE  
—TOP VIEW—



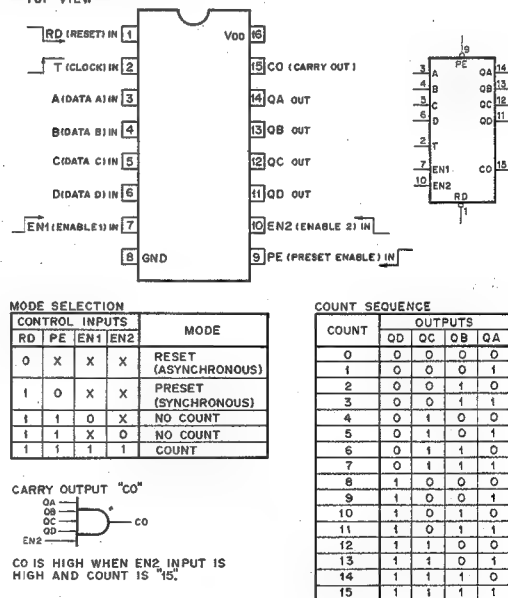
CD4093BE (RCA)  
TC4093BP (TOSHIBA)  
C-MOS 2-INPUT NAND SCHMITT TRIGGER  
—TOP VIEW—



CD4099BE (RCA)  
TC4099BP (TOSHIBA)  
C-MOS 8-BIT ADDRESSABLE LATCH  
—TOP VIEW—

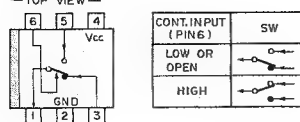


CD40161BE (RCA)  
TC40161BP (TOSHIBA)  
C-MOS PRESETTABLE SYNCHRONOUS 4-BIT BINARY COUNTER WITH ASYNCHRONOUS RESET  
—TOP VIEW—

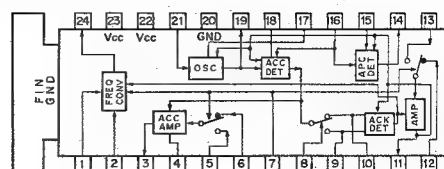




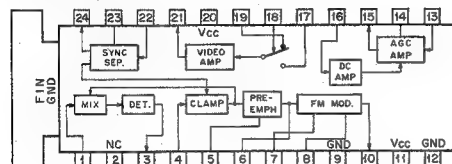
CX130 (SONY)  
ANALOG SWITCH  
—TOP VIEW—



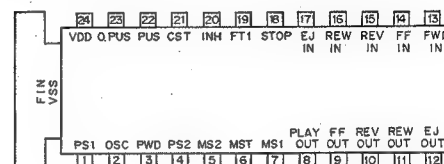
CX188 (SONY)  
—TOP VIEW—



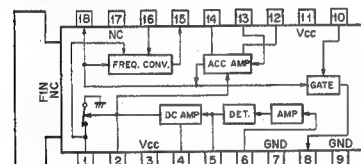
CX131A (SONY)  
—TOP VIEW—



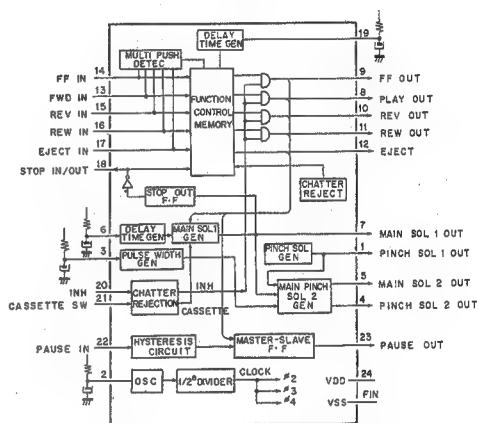
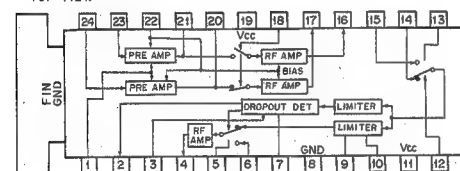
CX756A (SONY)  
P-MOS VTR SYSTEM CONTROL  
—TOP VIEW—



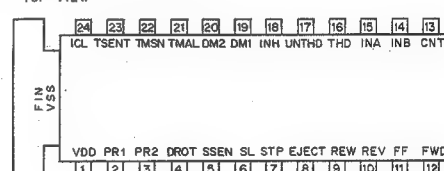
CX133A (SONY)  
—TOP VIEW—



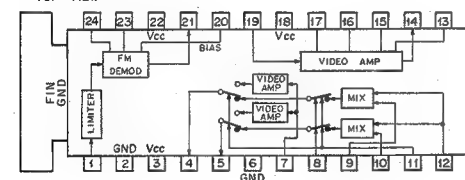
CX134A (SONY)  
—TOP VIEW—



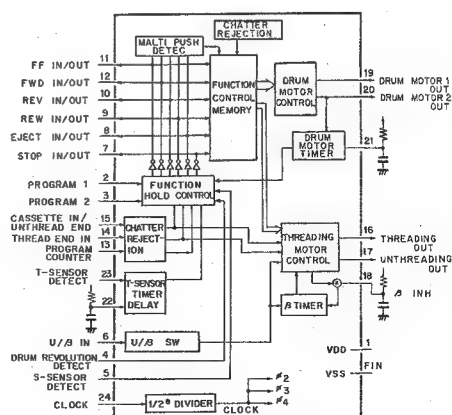
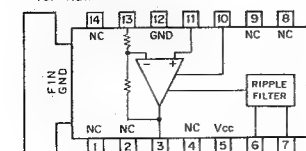
CX757 (SONY)  
P-MOS VTR SYSTEM CONTROL  
—TOP VIEW—



CX135 (SONY)  
—TOP VIEW—

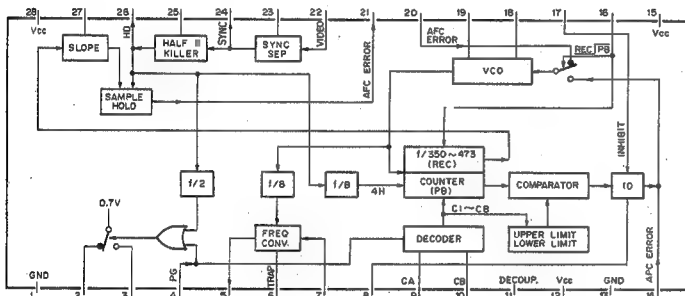
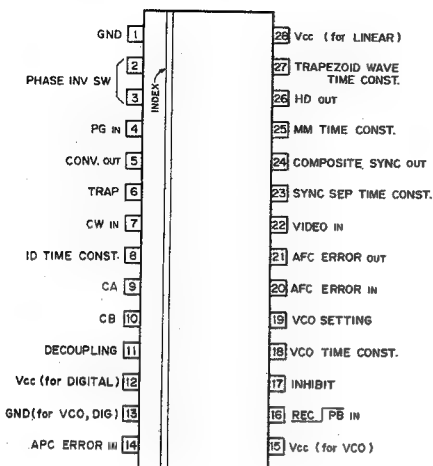


CX170 (SONY)  
AUDIO POWER AMP  
—TOP VIEW—





CX859 (SONY)  
— TOP VIEW —



DECODER TRUTH TABLE

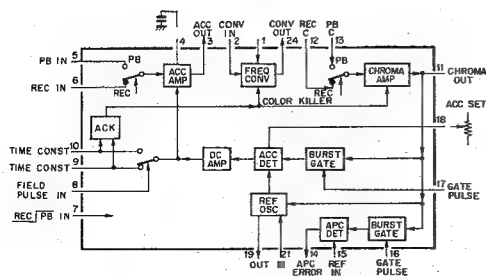
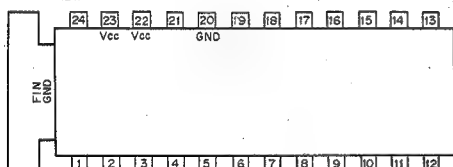
CB	CA	LOW	OPEN	HIGH
LOW	C1	C7	—	—
OPEN	C4	C5	C6	—
HIGH	—	*C2	C3	C8

\* PB: L --- C2  
PB: H --- C3

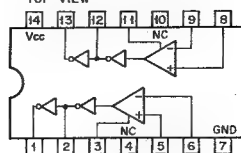
AFC/APC PRESET DATA

	AFC COUNT DOWN	APC ID COUNT	
		UPPER LIM.	LOWER LIM.
C1	1/473	105	95
C2	1/351	129	119
C3	1/353	137	127
C4	1/351	118	104
C5	1/351	131	117
C6	1/351	144	130
C7	1/350	136	104
C8	—	125	115

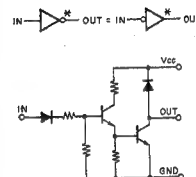
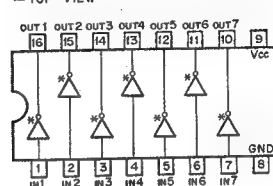
CX872 (SONY)  
— TOP VIEW —



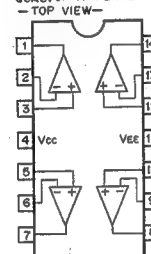
HA1807 (HITACHI)  
VOLTAGE COMPARATOR  
— TOP VIEW —



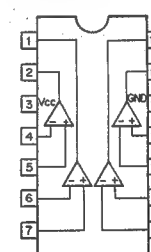
LB1264 (SANYO)  
7 STAGE DRIVER  
— TOP VIEW —



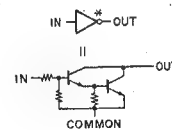
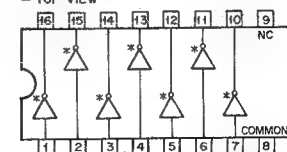
LM324 (NSC)  
μPC324C (NEC)  
HA17902P (HITACHI)  
NJM2902N (JRC)  
QUAD. OP. AMPLIFIER  
— TOP VIEW —



LM339 (NSC)  
μPC339C (NEC)  
COMPARATOR  
— TOP VIEW —

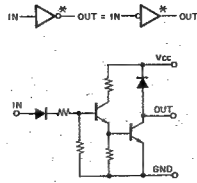
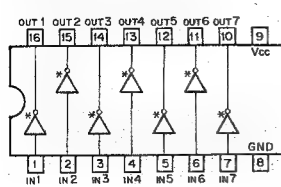


M54517P (MITSUBISHI)  
TRANSISTOR ARRAY  
— TOP VIEW —

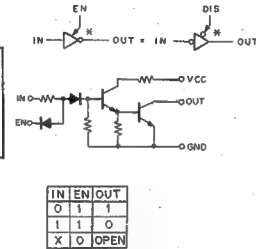
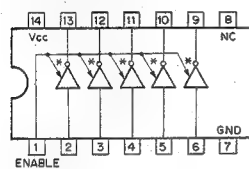




M54519P (MITSUBISHI)  
7 STAGE DRIVER  
— TOP VIEW —

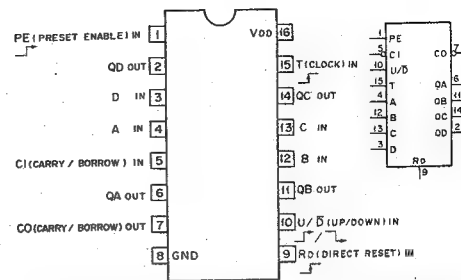




M54529P (MITSUBISHI)  
TRANSISTOR ARRAY  
— TOP VIEW —



IN	EN	OUT
0	1	1
1	1	0
X	0	OPEN

MC14510BCP (MOTOROLA)  
TC4510BP (TOSHIBA)  
C-MOS PRESETTABLE BCD UP/DOWN COUNTER  
— TOP VIEW —



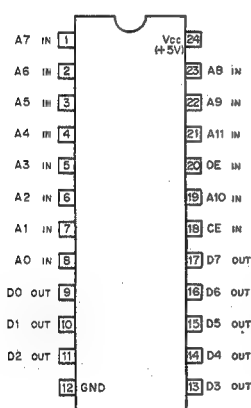
INPUTS					OUTPUTS			
T	RD	PE	CI	U/D	QD	QC	QB	QA
X	1	X	X	X	0	0	0	0
X	0	1	X	X	SET TO ABCD			
	0	0	0	1	COUNT UP			
	0	0	0	0	COUNT DOWN			
0	0	0	X	X	NO CHANGE			
X	0	0	1	X	NO CHANGE			

COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

CO=L  
CI=L B(DOWN-COUNT "0" OR UP-COUNT "9")

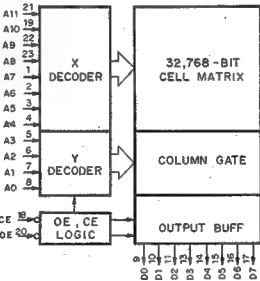
↑ COUNT UP  
↓ COUNT DOWN

MB8532 (FUJITSU)  
32K(4K-8) UV ERASABLE PROM  
— TOP VIEW —

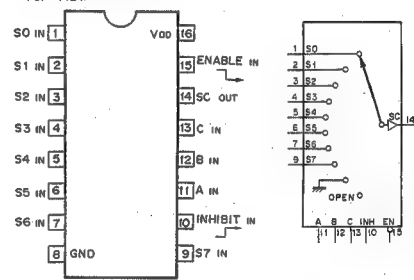


IN	OUT	FUNCTION
CE	OE	Dn
0	0	IDENTIFIED READ
1	X	HIGH Z STANDBY

AD-A11 ; ADDRESS  
CE ; CHIP ENABLE  
OE ; OUTPUT ENABLE  
DO-D7 ; DATA OUTPUTS



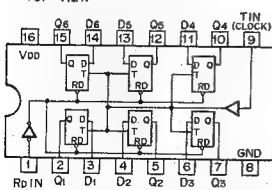
MC14512BCP(MOTOROLA)  
TC4512BP (TOSHIBA)  
μPD4512C (NEC)  
C-MOS 8-CHANNEL DATA SELECTOR/MULTIPLEXER  
— TOP VIEW —



CONTROL INPUTS					OUTPUT
EN	INH	C	B	A	SC
0	0	0	0	0	S0
0	0	0	0	1	S1
0	0	0	1	0	S2
0	0	0	1	1	S3
0	0	1	0	0	S4
0	0	1	0	1	S5
0	0	1	1	0	S6
0	0	1	1	1	S7
0	1	X	X	X	GND
1	X	X	X	X	OPEN

0; LOW LEVEL  
1; HIGH LEVEL  
X; LOW OR HIGH

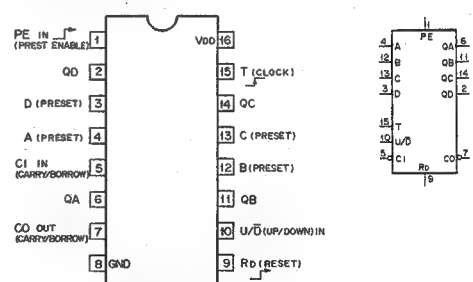
MC14174BCP (MOTOROLA)  
TC40174BP (TOSHIBA)  
C-MOS D-TYPE FLIP-FLOP  
— TOP VIEW —



INPUTS		OUTPUT
T	D	Q
1	0	1
1	1	1
1	X	Q0
X	X	0

0; LOW LEVEL  
1; HIGH LEVEL  
X; DON'T CARE

MC14516BCP (MOTOROLA)  
TC4516BP (TOSHIBA)  
μPD4516C (NEC)  
C-MOS PRESETTABLE BINARY UP/DOWN COUNTER  
— TOP VIEW —



INPUTS					OUTPUTS			
T	RD	PE	CI	U/D	QD	QC	QB	QA
X	1	X	X	X	0	0	0	0
X	0	1	X	X	SET TO A,B,C,D			
1	0	0	0	1	COUNT UP			
1	0	0	0	0	COUNT DOWN			
0	0	0	X	X	NO CHANGE			
X	0	0	1	X	NO CHANGE			

COUNT	OUTPUTS			
	QD	QC	QB	QA
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
10	1	0	1	0
11	1	0	1	1
12	1	1	0	0
13	1	1	0	1
14	1	1	1	0
15	1	1	1	1

CO=L  
CI=L B(DOWN-COUNT "0" OR UP-COUNT "15")

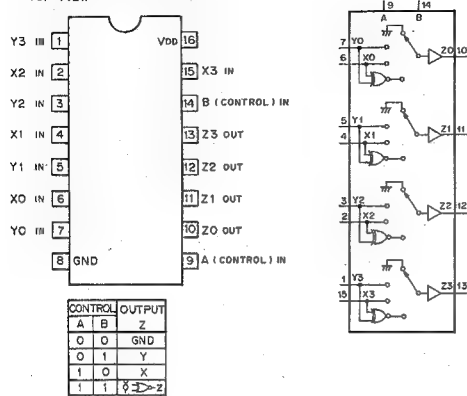
↑ COUNT UP  
↓ COUNT DOWN



MC14519BCP (MOTOROLA)  
μPD4519C (NEC)

C-MOS 4-BIT AND/OR SELECTOR  
2-CHANNEL DATA SELECTOR  
EXCLUSIVE "NOR" GATE

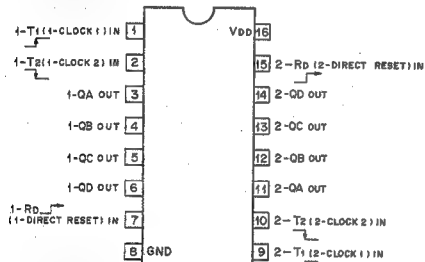
— TOP VIEW —



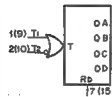
MC14520BCP (MOTOROLA)  
TC4520BP (TOSHIBA)

C-MOS DUAL 4-BIT BINARY UP COUNTER

— TOP VIEW —



STATE	OUTPUTS
00000000	QA QB QC QD
0	0 0 0 0
1	0 0 0 1
2	0 0 1 0
3	0 0 1 1
4	0 1 0 0
5	0 1 0 1
6	0 1 1 0
7	0 1 1 1
8	1 0 0 0
9	1 0 0 1
10	1 0 1 0
11	1 0 1 1
12	1 1 0 0
13	1 1 0 1
14	1 1 1 0
15	1 1 1 1

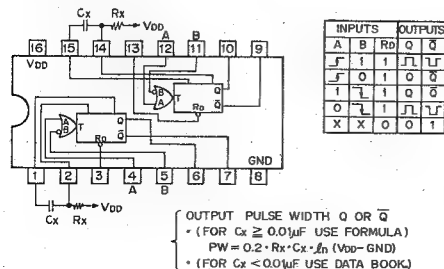


T1	T2	Rd	ACTION
1	0	0	INCREMENT COUNTER
0	1	0	INCREMENT COUNTER
1	x	0	NO CHANGE
x	1	0	NO CHANGE
1	0	1	NO CHANGE
0	1	1	NO CHANGE
1	1	0	NO CHANGE
x	x	1	QA THRU QD = 0

MC14528BCP (MOTOROLA)  
TC4528BP (TOSHIBA)

C-MOS RETRIGGERABLE / RESETTABLE MMV

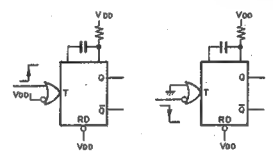
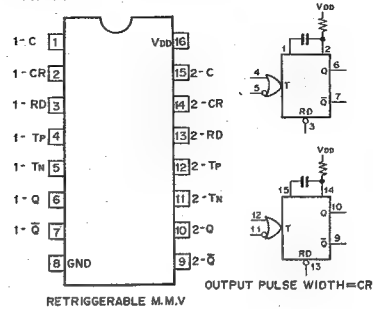
— TOP VIEW —



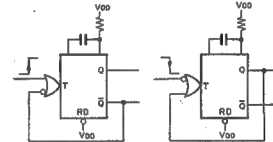
MC14538BCP (MOTOROLA)  
HD14538BP (HITACHI)

C-MOS DUAL RETRIGGERABLE/NON-RETRIGGERABLE MONOSTABLE MULTIVIBRATOR

— TOP VIEW —



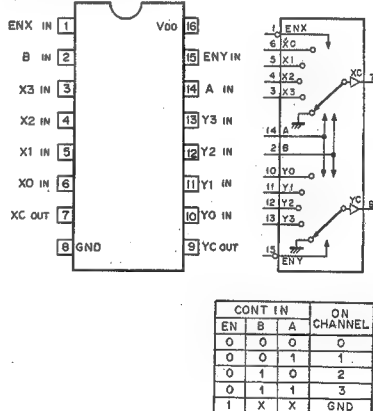
NON-RETRIGGERABLE M.M.V.



MC14539BCP (MOTOROLA)  
TC4539BP (TOSHIBA)  
μPD4539C (NEC)

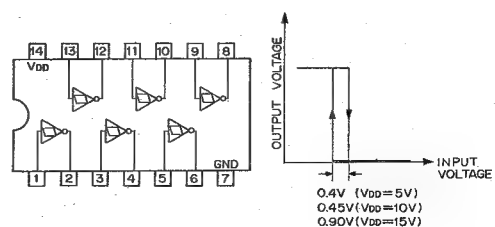
C-MOS DUAL 4-CHANNEL DATA SELECTOR/MULTIPLEXER

— TOP VIEW —



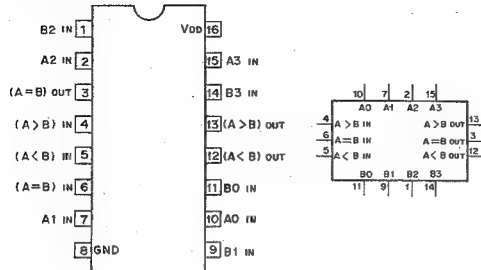
MC14584BCP (MOTOROLA)  
C-MOS SCHMITT TRIGGER INVERTER

— TOP VIEW —



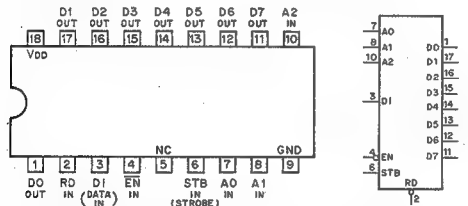


MC14585BCP (MOTOROLA)  
TC4585BP (TOSHIBA)  
C-MOS 4-BIT MAGNITUDE COMPARATOR  
-TOP VIEW-



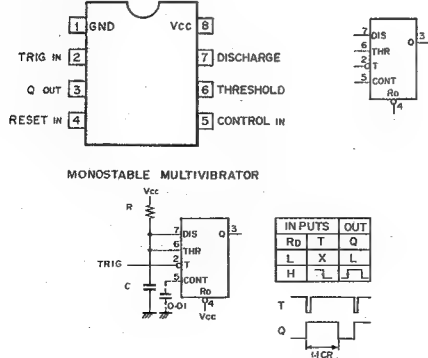
	INPUTS					CASCADING			OUTPUTS		
	A3 B3	A2 B2	A1 B1	A0 B0		A<B	A=B	A>B	A<B	A=B	A>B
A > B	A3 > B3	X	X	X		X	X	1	0	0	1
	A3 = B3	A2 > B2	X	X							
	A3 < B3	A2 = B2	A1 > B1	X							
	A3 < B3	A2 < B2	A1 = B1	A0 > B0							
A = B	A3 = B3	A2 = B2	A1 = B1	A0 = B0		0	0	1	0	0	1
	A3 = B3	A2 = B2	A1 = B1	A0 < B0		0	1	X	0	1	0
	A3 = B3	A2 = B2	A1 = B1	A0 > B0		1	0	X	1	0	0
	A3 = B3	A2 = B2	A1 = B1	A0 = B0							
A < B	A3 < B3	A2 < B2	A1 < B1	X		X	X	X	1	0	0
	A3 < B3	A2 < B2	X	X							
	A3 < B3	A2 < B2	X	X							
	A3 < B3	A2 < B2	X	X							

MC14598BCP (MOTOROLA)  
C-MOS 8-BIT BUS-COMPATIBLE THREE-STATE LATCHES  
-TOP VIEW-

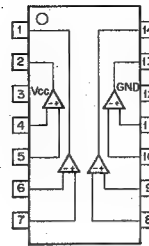


LATCH TRUTH TABLE				LATCH SELECTION			
CONTROL INPUT	EN	STB	RD	CONTROL INPUT	A2	A1	A0
OUTPUT OF ADDRESSED LATCH	1	0	1	OUTPUT OF OTHER LATCHES	0	0	0
NO CHANGE	1	1	1	DATA	0	0	1
NO CHANGE	1	X	0	0	0	1	0
OPEN	0	X	X	OPEN	0	1	1
					1	0	0
					1	0	1
					1	1	0
					1	1	1

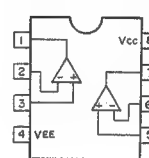
NE555N (SIGNETICS)  
M51841P (MITSUBISHI)  
TIMER  
-TOP VIEW-



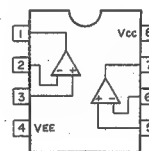
NJM2901N (JRC)  
SINGLE SUPPLY COMPARATOR  
-TOP VIEW-



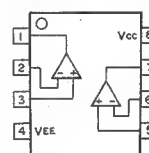
NJM2903D (JRC)  
OPERATIONAL AMPLIFIER  
-TOP VIEW-



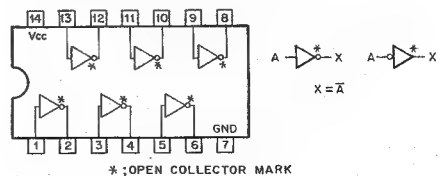
RC4558 (RAYTHEON)  
μPC4558C (NEC)  
NJM4558D (JRC)  
μPC4558C (NEC)  
OPERATIONAL AMPLIFIER  
-TOP VIEW-



NJM4562D (JRC)  
OPERATIONAL AMPLIFIER  
-TOP VIEW-

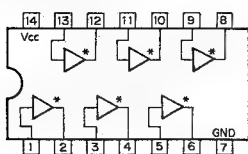


SN74LS05N (TI)  
TTL INVERTER WITH OPEN COLLECTOR  
-TOP VIEW-





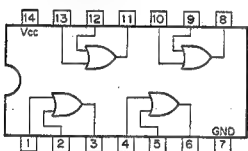
SN7407N (TI)  
TTL BUFFER / DRIVER  
WITH OPEN-COLLECTOR  
—TOP VIEW—



$$A \rightarrow X$$

$$X = A$$

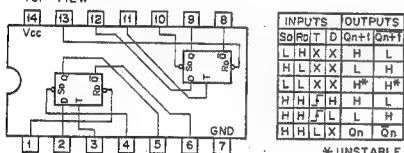
SN74LS32N (TI)  
TTL 2-INPUT POSITIVE-OR GATE  
—TOP VIEW—



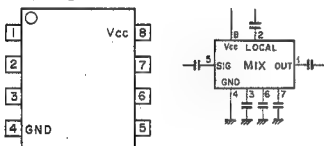
$$A \text{ --- } B \text{ --- } X$$

$$X = A + B = A \text{ OR } B$$

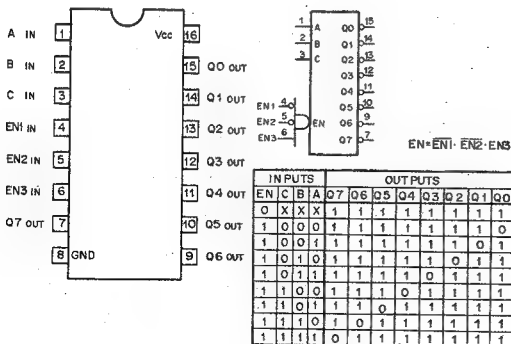
SN74LS74AN (TI)  
TTL D-TYPE FLIP FLOP WITH DIRECT SET/RESET  
—TOP VIEW—



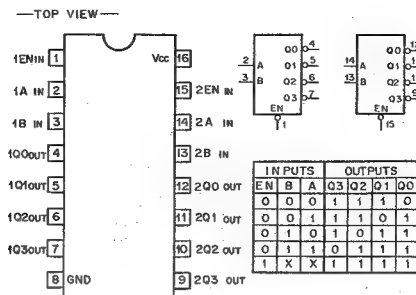
SN16913P (TI)  
BALANCED MIXER  
—TOP VIEW—



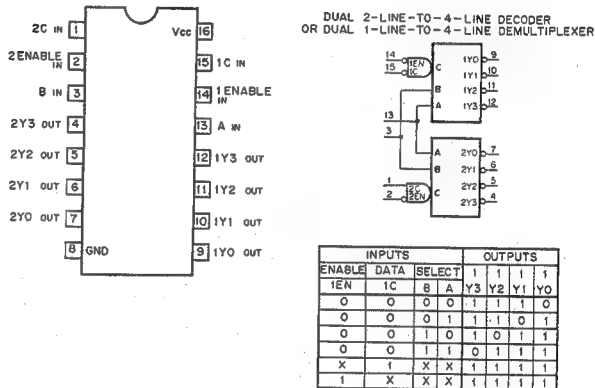
SN74LS138N (TI)  
TTL 3-TO-8-LINE DECODER/DEMULPLEXER  
—TOP VIEW—



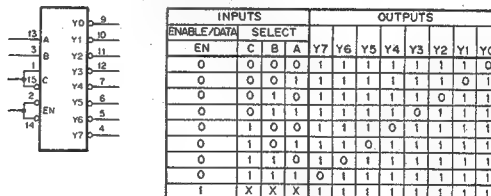
SN74LS139N (TI)  
TTL 2-TO-4-LINE DECODER/DEMULPLEXER  
—TOP VIEW—



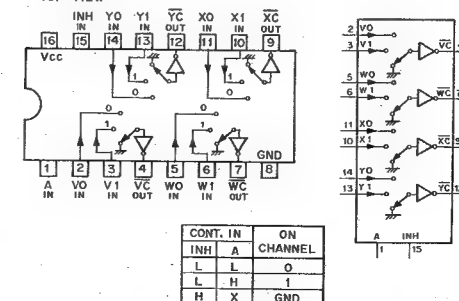
SN74LS156N (TI)  
TTL DUAL 2-LINE-TO-4-LINE DECODER / DEMULPLEXER  
(OPEN COLLECTOR OUTPUT)  
—TOP VIEW—



3-LINE-TO-8-LINE DECODER  
OR 1-LINE-TO-8-LINE DEMULPLEXER



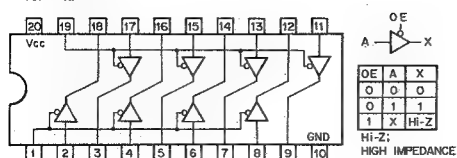
SN74LS158N (TI)  
TTL 2-LINE-TO-1-LINE INVERTED DATA SELECTOR/MULTIPLEXER  
—TOP VIEW—





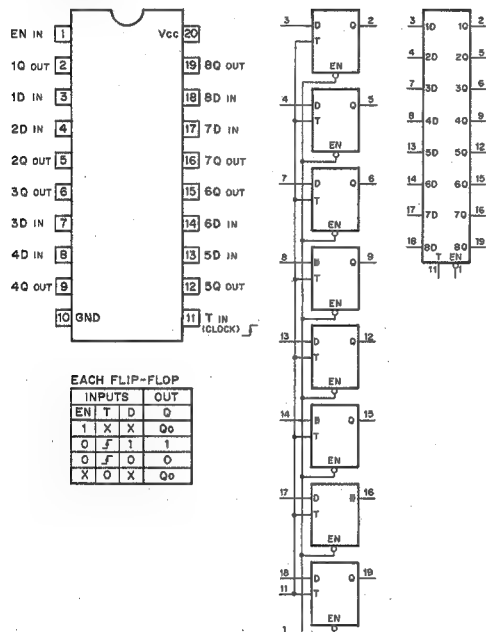
SN74LS244N (TI)  
M74LS244P (MITSUBISHI)  
TTL OCTAL BUFFER/LINE DRIVER  
(3-STATE OUTPUT)

—TOP VIEW—



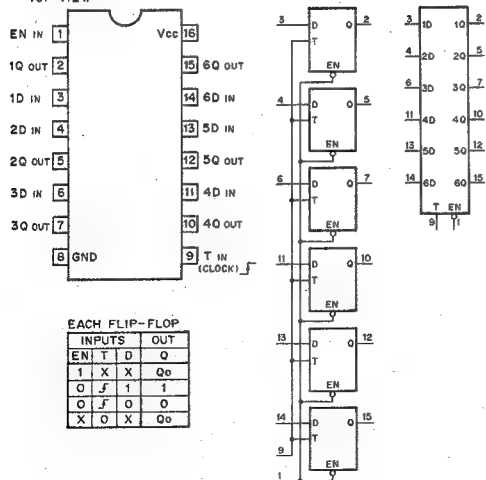
SN74LS377N (TI)  
TTL D-TYPE FLIP-FLOP WITH ENABLE

—TOP VIEW—



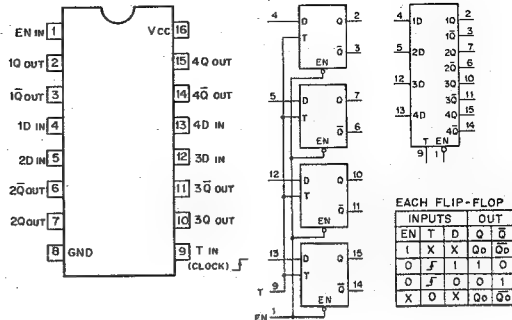
SN74LS378N (TI)  
TTL D-TYPE FLIP-FLOP WITH ENABLE

—TOP VIEW—



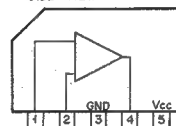
SN74LS379N (TI)  
TTL QUAD D-TYPE FLIP-FLOP WITH ENABLE

—TOP VIEW—



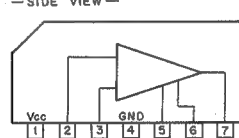
TA7060AP (TOSHIBA)  
TA7060P (TOSHIBA)  
LINEAR AMP

—SIDE VIEW—



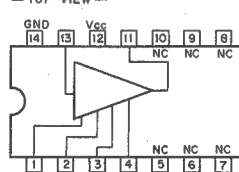
TA7069P (TOSHIBA)  
VIDEO AMPLIFIER

—SIDE VIEW—



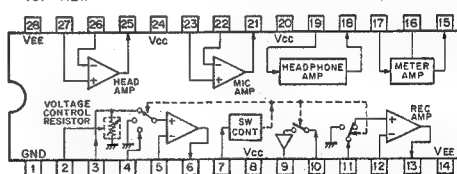
TA7076P (TOSHIBA)  
VIDEO LINEAR AMP

—TOP VIEW—



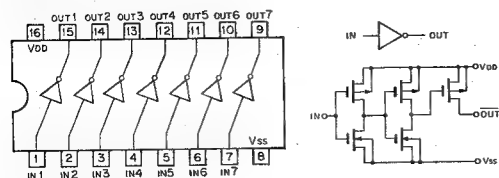
TA7617AP (TOSHIBA)  
AUDIO AMPLIFIER FOR TAPE DECK

—TOP VIEW—

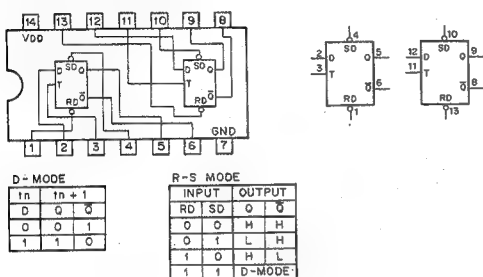




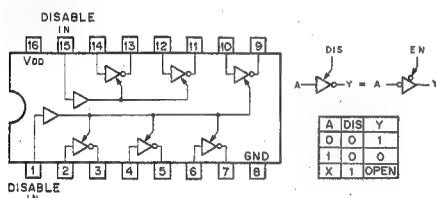
TC50678P (TOSHIBA)  
C-MOS HIGH VOLTAGE BUFFER/INVERTING TYPE  
—TOP VIEW—



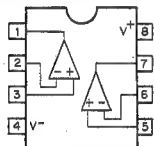
TC40H074P (TOSHIBA)  
C-MOS HIGH SPEED D-TYPE FLIP-FLOP WITH DIRECT SET/RESET  
—TOP VIEW—



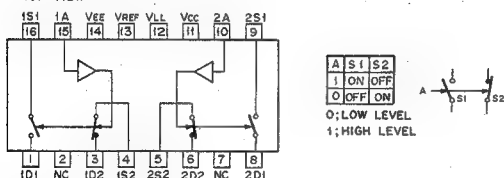
TC40H368P (TOSHIBA)  
C-MOS INVERTING 3-STATE BUFFER  
—TOP VIEW—



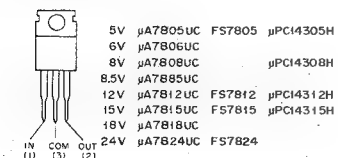
TL082CP (TI)  
OPERATIONAL AMPLIFIER  
(JFET-INPUT)  
—TOP VIEW—



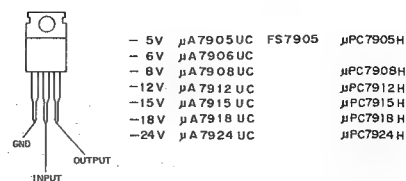
TL191CN (TI)  
TWIN DUAL COMPLEMENTARY  
BI-MOS ANALOG SWITCH  
—TOP VIEW—



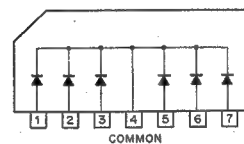
μA7800UC (FSC)  
μPC14300H (NEC)  
μPC7800H (NEC)  
POSITIVE VOLTAGE REGULATOR (1A)



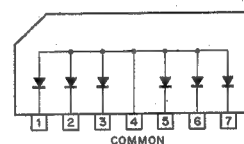
μA7900UC (FSC)  
FS7900 (SANKEN)  
NEGATIVE VOLTAGE REGULATOR (1A)



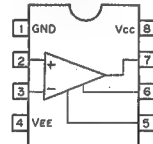
μPA54H (NEC)  
DIODE ARRAY  
—SIDE VIEW—



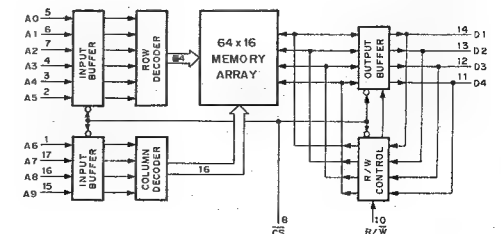
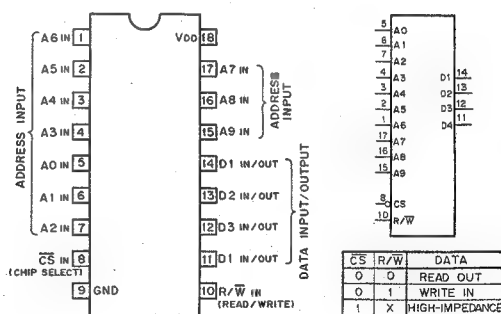
μPA64H (NEC)  
DIODE ARRAY  
—SIDE VIEW—



μPC311C (NEC)  
VOLTAGE COMPARATOR  
—TOP VIEW—

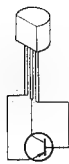


μPD444C (NEC)  
C-MOS 4096-BIT (1024x4) STATIC RAM  
—TOP VIEW—





## (2SAxxx, 2SBxxx)



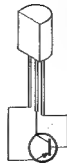
2SA733  
2SA844



2SA678  
2SA1026  
2SA1027R



2SB733  
2SB734



2SA684  
2SA773  
2SB739  
2SB740



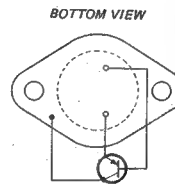
2SA1141  
TYPE NO.  
IMPRINTED



2SA771  
2SB834  
2SB856



2SA1115



BOTTOM VIEW

2SA747  
2SA747A

## (2SCxxx, 2SDxxx)



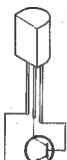
2SC641K  
2SC945  
2SC1363  
2SC1364  
2SC1634



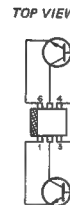
2SC403C  
2SC1636



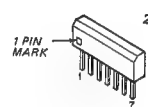
2SD773  
2SD774



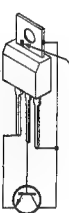
2SC1474  
2SD788  
2SD789



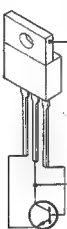
2SC1963



2SC2771



2SC1124  
EMITTER  
MARK



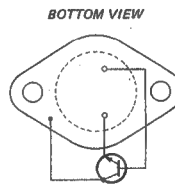
2SC1983  
2SC2315



2SC2681

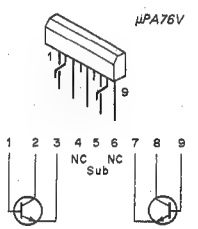


2SC2603



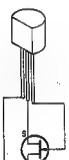
BOTTOM VIEW

2SC1116

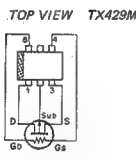


μPA76V

## (OTHER)



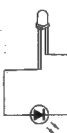
2SK43



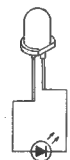
TOP VIEW TX429M



SPS102



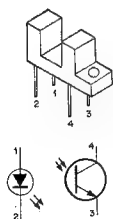
BR5104S



GL-5HD5

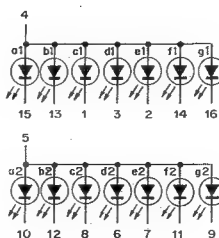
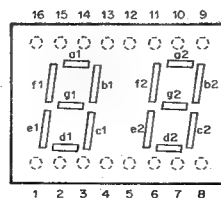


HLM-1302  
TLO123  
TLO124



PS4005

TLR321 (TOSHIBA)  
DUAL 7-SEGMENT LED  
—TOP VIEW—









## SECTION 17

### PRINTED CIRCUIT BOARD AND SCHEMATIC DIAGRAM

#### 17-1. CIRCUIT FUNCTION OF THE PRINTED CIRCUIT BOARD

The circuit board information is provided below.

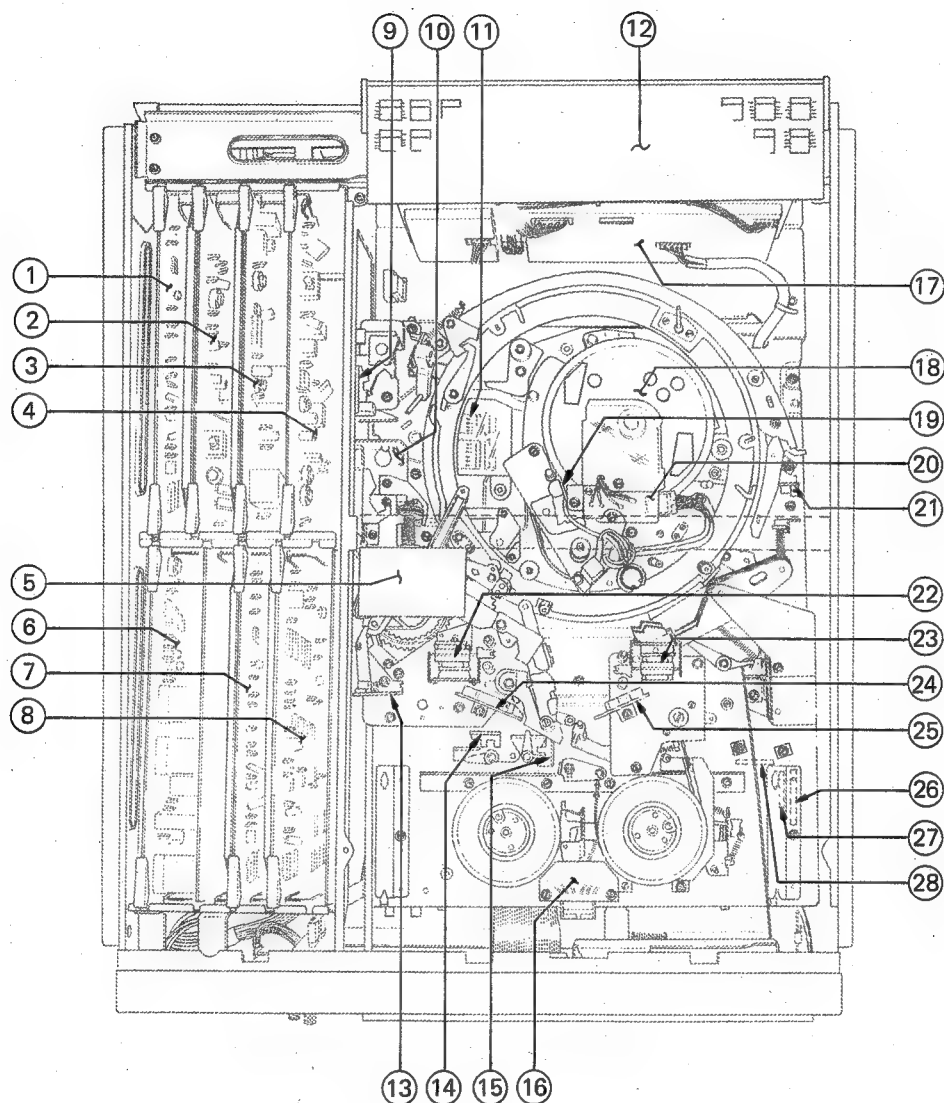
System	Circuit board	Circuit function
VIDEO	MD-18	• Luminance and chrominance signal modulator.
	RP-10-1	• REC/PB amplifier • Rotary erase amplifier
	DA-6	• DT head amplifier
	YD-14	• Luminance signal demodulator
	CD-20	• Chrominance signal demodulator
AUDIO	AU-13	• REC/PB amplifier • Audio system control
	AU-25	• Bias oscillator • CH-1/CH-2 erase oscillator
	SA-9	• Input impedance converter (high ↔ low)
	AO-2	• Audio monitor switch
	AO-3	• CH-1/CH-2 output amplifier • Monitor out selector/output amplifier
	HP-5	• Headphones level adj.
SERVO	SV-52-1	• Capstan/drum speed and phase servo
	CF-9	• CTL REC/PB amplifier
	RS-3-1 (RS-4)	• Tape tension detector • Reel motor driver control
	EM-1	• Reel rotation detector
	MD-18	• Blanking switcher
	FC-10	• When the set is put into the TBC mode and DT mode simultaneously, this circuit delays the switching pulse.
DYNAMIC TRACKING	DT-3-1	• Dynamic tracking
TIME CODE	TC-13-1	• Time code REC/PB amplifier • Automatic reference sync selector (for servo) • CTL counter (for display)
SYSTEM CONTROL	SY-92	• Function control
	SY-37	• System control micro processor
	SY-71	• Cassette compartment motor driver • Threading motor driver • Skew solenoid driver • Pinch solenoid driver • T brake solenoid driver • S brake solenoid driver • S tension regulator solenoid driver • Humidity detector
	KY-9 (KY-14)	• Key board with serial data ↔ parallel data converter
	DP-9	• Display
	PC-9	• Search dial
	PC-14	• Search dial
	PD-19 (PD-15, PD-17, PD-21, DR-9, DR-19, BP-6)	• Full erase oscillator • 12 V regulator • 5 V regulator • -12 V regulator • Drum motor power driver • Capstan motor power driver • Reel motor power driver • Dynamic tracking driver
POWER SUPPLY	PW-50	• Power supply
	PW-79	• Switching regulator
	FU-16	• Fuse



# LOCATION OF PCB

## 17-2. LOCATION OF THE PRINTED CIRCUIT BOARD

< TOP VIEW >

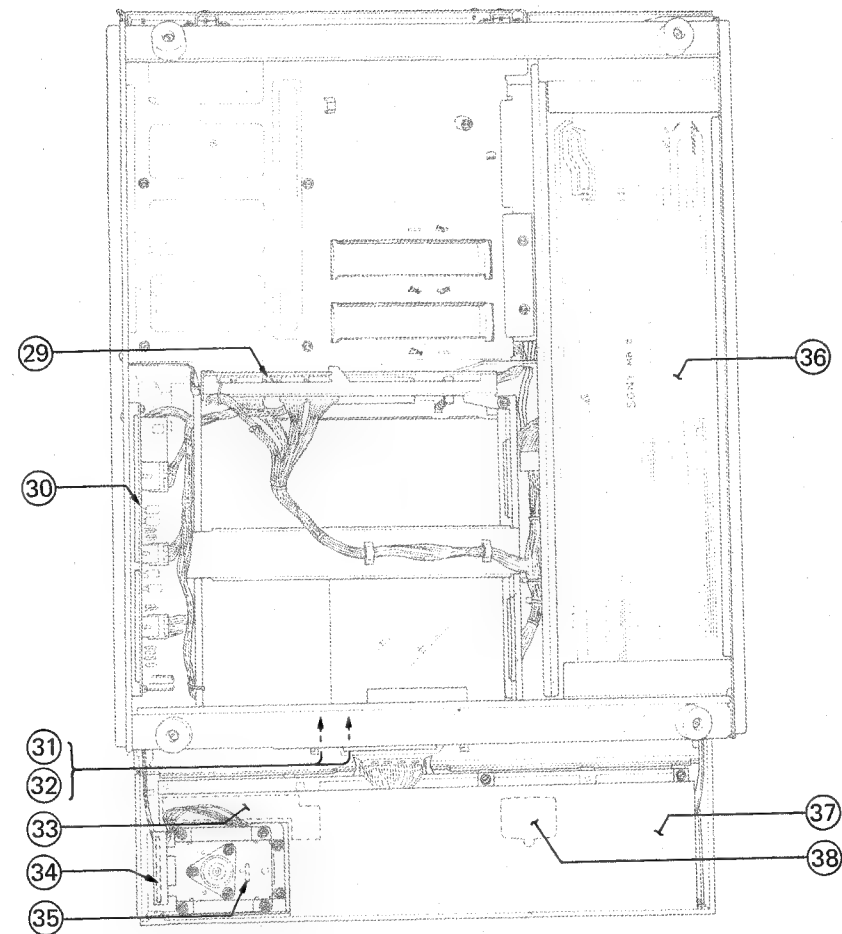




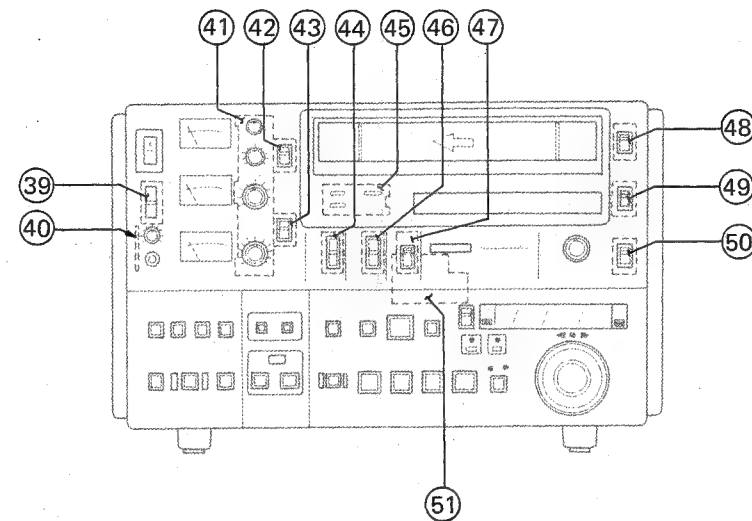
# LOCATION OF PCB

# LOCATION OF PCB

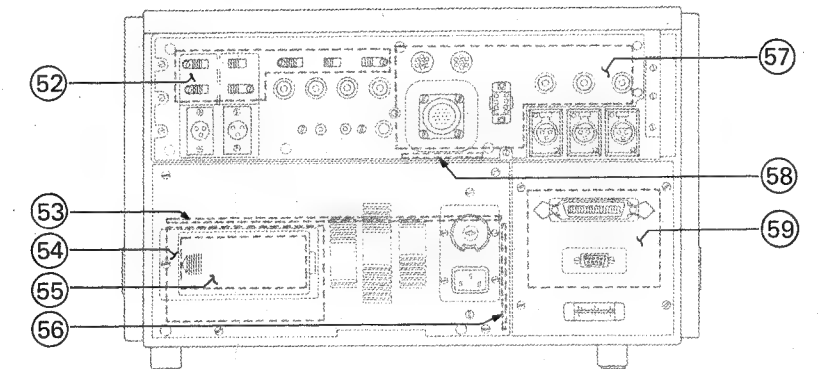
< BOTTOM VIEW >



< FRONT VIEW >



< REAR VIEW >



AO-2	39
AO-3	57
AU-13 (AU-25)	6
CC-9	26
CC-10	28
CC-11	27
CD-20	2
DA-6	18
DP-9	33
DT-3-1	12
EK-2 (A)	13
EK-2 (B)	21
EK-3	9
EM-1	16

FC-10	5
FU-16	55
HP-5	40
KY-9	37
KY-14	38
LE-4 (A)	23
KE-4 (B)	22
LV-1	42
MB-9	29
MB-36-1	36
MD-18	4
MF-1	41
MS-5 (A)	43

MS-5 (B)	44
MS-5 (C)	46
MS-5 (D)	47
MS-5 (E)	48
MS-5 (F)	49
PC-7 (A)	15
PC-7 (B)	14
PC-8	25
PC-9	34
PC-12	24
PC-14	35
PD-19 (PD-15, PD-17, PD-21, DR-19, DR-9, BP-6)	53

PH-1 (A)	23
PH-1 (B)	22
PR-33	50
PW-50	56
PW-79	54
RE-3	51
RM-4	59
RP-10-1	17
RS-3-1 (RS-4)	7
SA-9	52
SR-17	20
SV-52-1 (CF-9)	8
SY-37	32

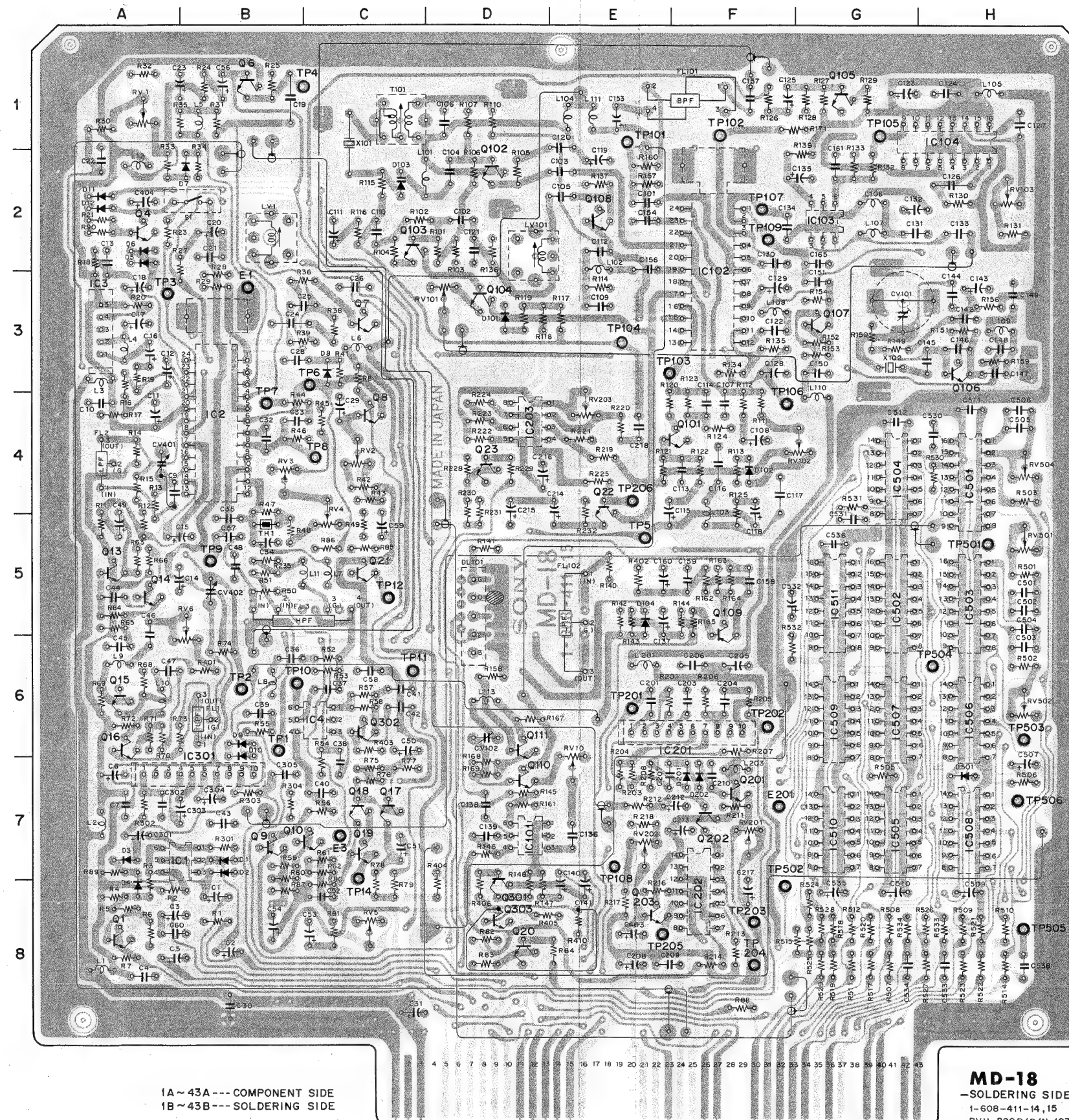
SY-71	30
SY-92	31
TC-12	19
TC-13-1	1
TM-4	11
TM-8	10
TM-14	58
WL-1	45
YD-14	3



# MD-18 MD-18

## MD-18 (Y/C MODULATOR) (BLANKING SWITCHER)

Serial No. 10301 and higher

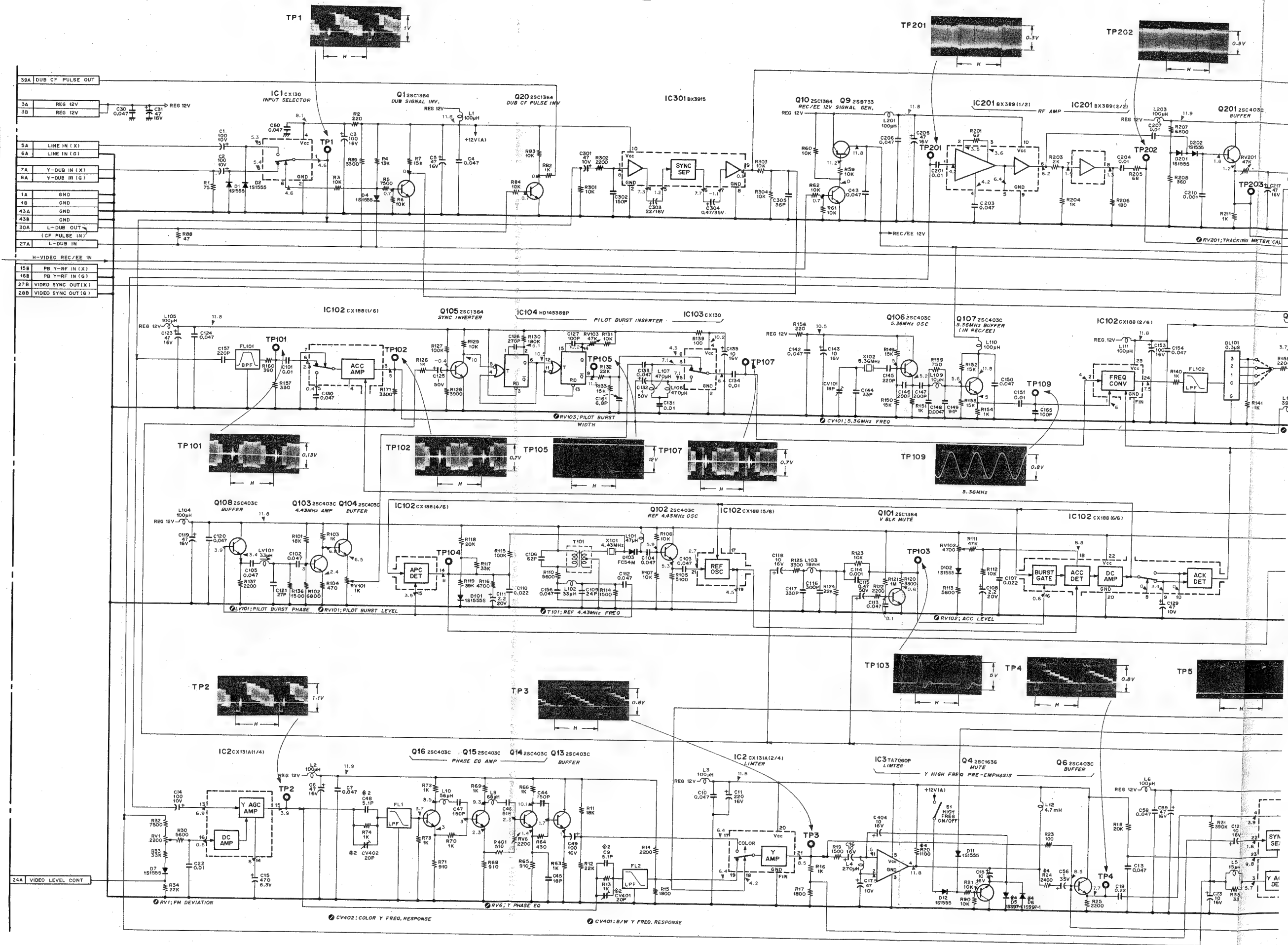


CV101	G-3	RV1	A-1
CV102	D-6	RV2	C-4
CV401	A-4	RV3	B-4
CV402	B-5	RV4	C-5
		RV5	C-8
		RV6	B-5
D1	B-7	RV10	E-6
D2	B-7	RV101	D-3
D3	A-7	RV102	G-4
D4	A-8	RV103	H-2
D5	A-2	RV201	F-7
D6	A-2	RV202	E-7
D7	B-2	RV203	E-4
D8	C-3	RV501	H-5
D9	B-6	RV502	H-6
D10	B-7	RV504	H-4
D11	A-2		
D12	A-2	S1	B-2
D101	D-3		
D102	F-4		
D103	C-2	T101	C-1
D104	E-5		
D201	F-7	TP1	B-6
D202	F-7	TP2	B-6
D501	H-7	TP3	A-3
		TP4	B-1
DL101	D-5	TP5	E-5
		TP6	C-3
E1	B-3	TP7	B-4
E3	C-7	TP8	C-4
E201	F-7	TP9	B-5
		TP10	B-6
FL1	B-6	TP11	C-6
FL2	A-4	TP12	C-5
FL3	B-5	TP14	C-8
FL101	E-2	TP101	E-1
FL102	E-5	TP102	F-2
		TP103	F-3
IC1	B-7	TP104	E-3
IC2	B-4	TP105	G-1
IC3	A-3	TP106	F-4
IC4	C-6	TP107	F-2
IC101	D-7	TP108	E-7
IC102	F-2	TP109	F-2
IC103	G-2	TP201	E-6
IC104	H-1	TP202	F-6
IC201	F-6	TP203	F-8
IC202	F-8	TP204	F-8
IC203	D-4	TP205	E-8
IC301	B-7	TP206	E-4
IC501	H-4	TP501	H-5
IC502	G-5	TP502	F-8
IC503	H-5	TP503	H-6
IC504	G-4	TP504	H-6
IC505	G-7	TP505	H-8
IC506	H-6	TP506	H-7
IC507	G-6		
IC508	H-7	X101	C-1
IC509	G-6	C102	G-3
IC510	G-7		
IC511	G-5		
LV1	B-2		
LV101	D-2		
Q1	A-8		
Q4	A-2		
Q6	B-1		
Q7	C-3		
Q8	C-4		
Q9	B-7		
Q10	C-7		
Q13	A-5		
Q14	A-5		
Q15	A-6		
Q16	A-6		
Q17	C-7		
Q18	C-7		
Q19	C-7		
Q20	D-8		
Q21	C-5		
Q22	E-4		
Q23	D-4		
Q101	F-4		
Q102	D-2		
Q103	C-2		
Q104	D-3		
Q105	G-1		
Q106	H-3		
Q107	G-3		
Q108	E-2		
Q109	F-5		
Q110	D-7		
Q111	D-6		
Q201	F-7		
Q202	F-7		
Q203	E-8		
Q301	D-8		
Q302	C-6		
Q303	D-8		

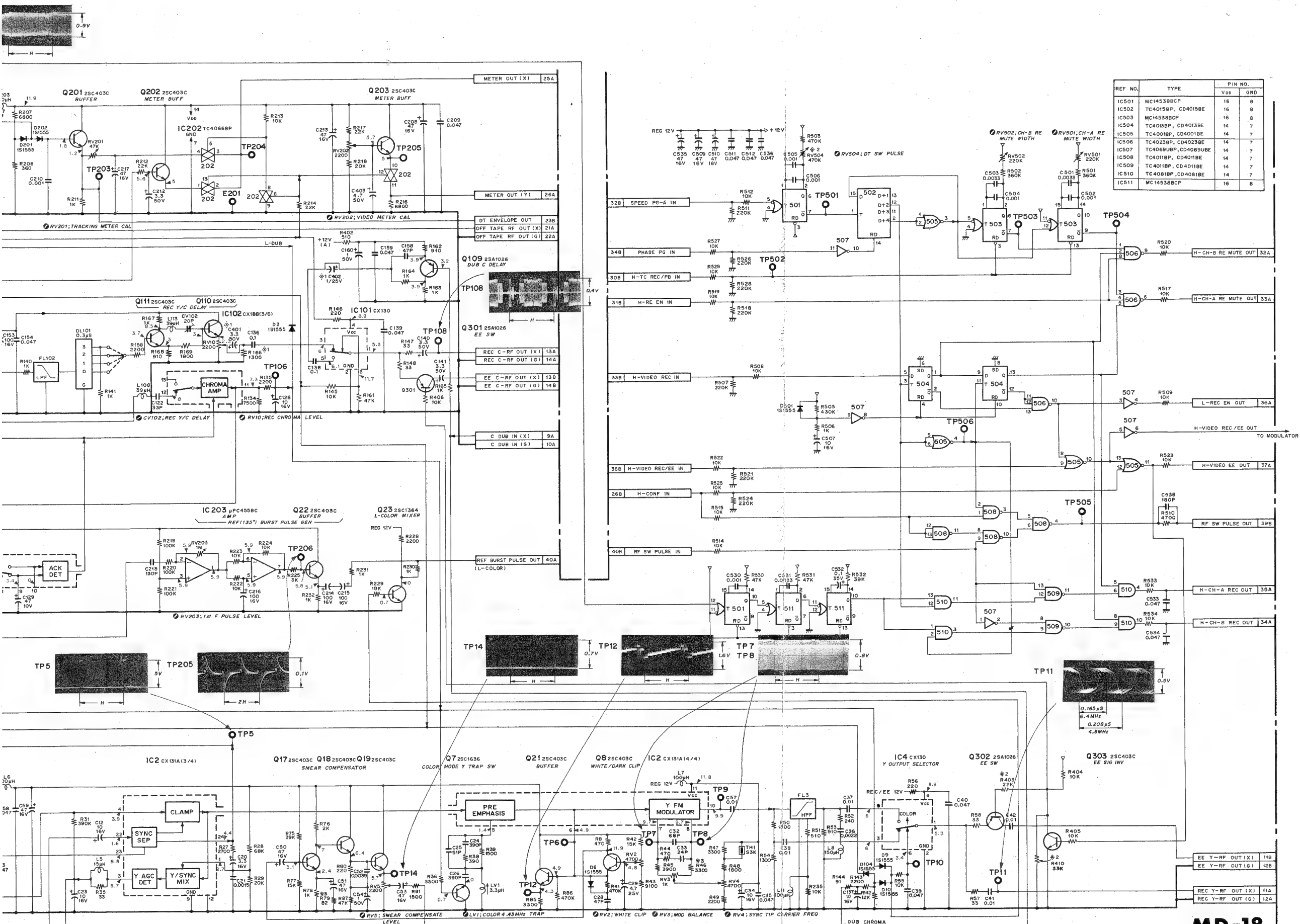


**MD-18 (Y/C MODULATOR)  
(BLANKING SWITCHER)**

NOTE			
MARK	CHANGE	INFORMATION	SERIAL NO.
※ 1	C401 33/25V SHORTED R166 150K DELETED C402 1/25V SHORTED		10221 ~
※ 2	C9 10P(15P) ⇒ 5.1P CV401 20P ADDED  C48 10P(15P) ⇒ 5.1P CV402 20P ADDED		10301 ~
	R403 10K ⇒ 22K RV504 220K ⇒ 470K  R401 10K ⇒ 33K		10301 ~ (1326)
※ 3	R46 5900 ⇒ 3300 R73 150 ⇒ 33		10791 ~
※ 4	D5.6 151925 ⇒ 15397-1 R20 1K ⇒ 110K R24 2200 ⇒ 2400		11698 ~





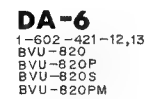


MD-18

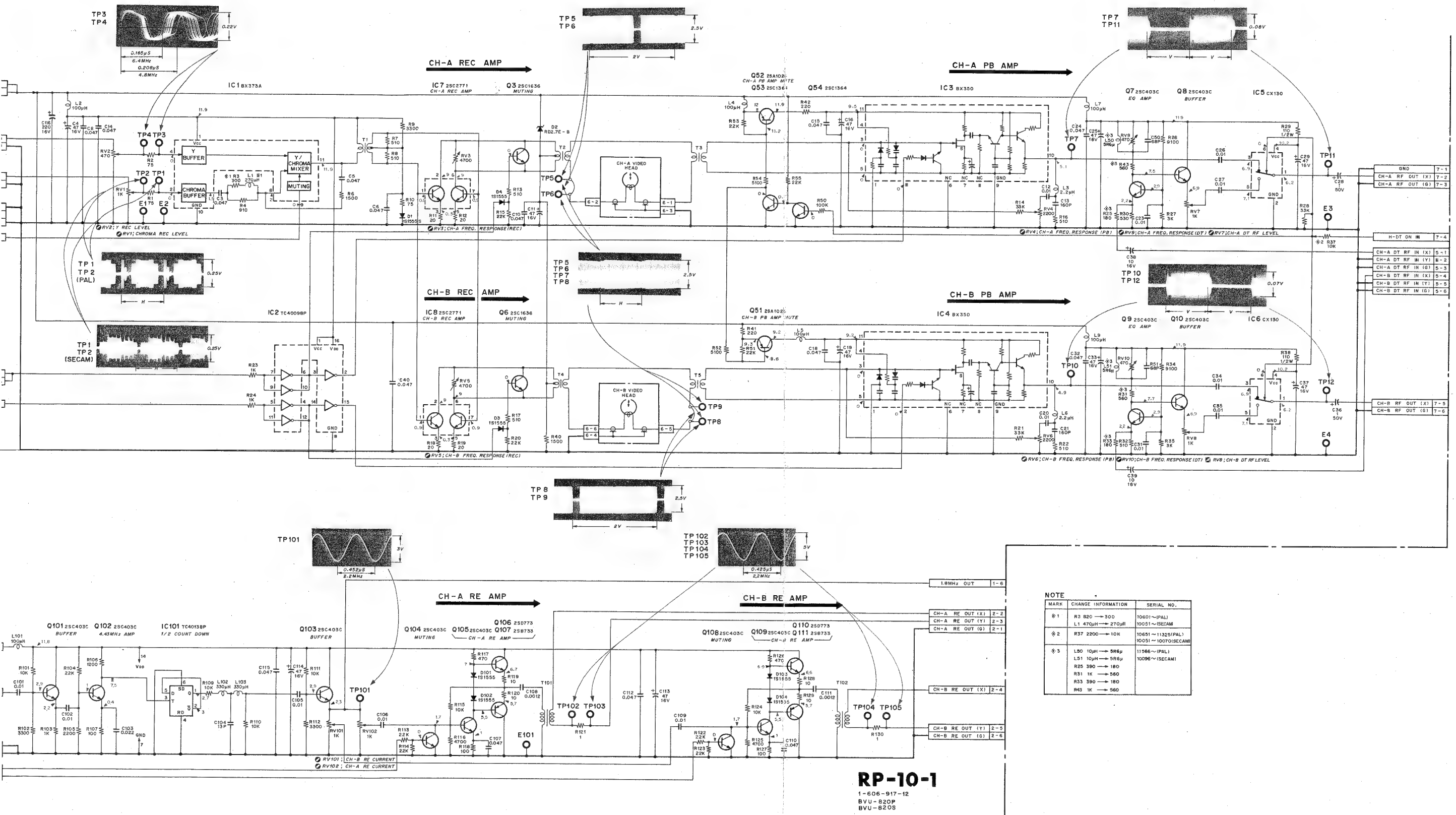
1-608-411-11,12,13,14,15  
BVU-820P



PR-10-1 (Y/C REC PB AMPLIFIER)  
(ROTARY ERASE AMPLIFIER)

17-11



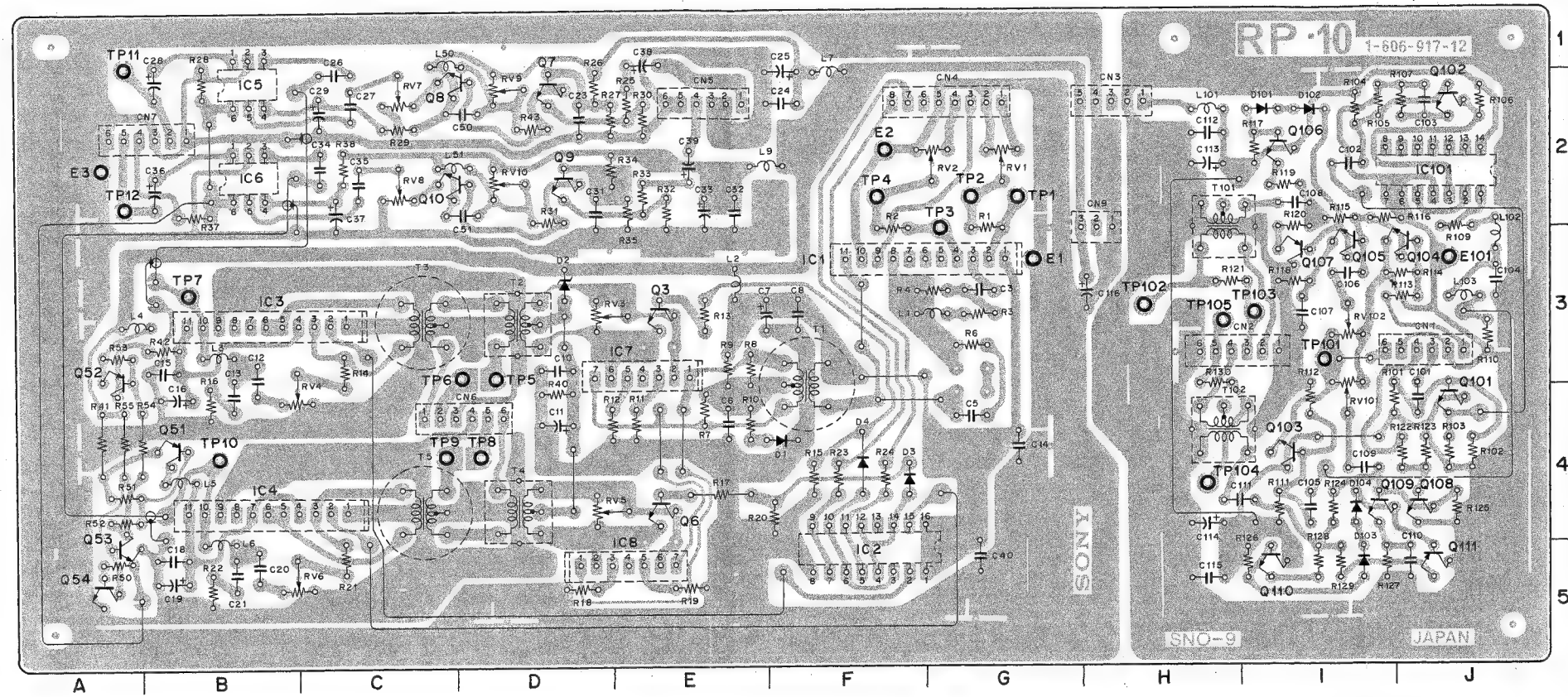




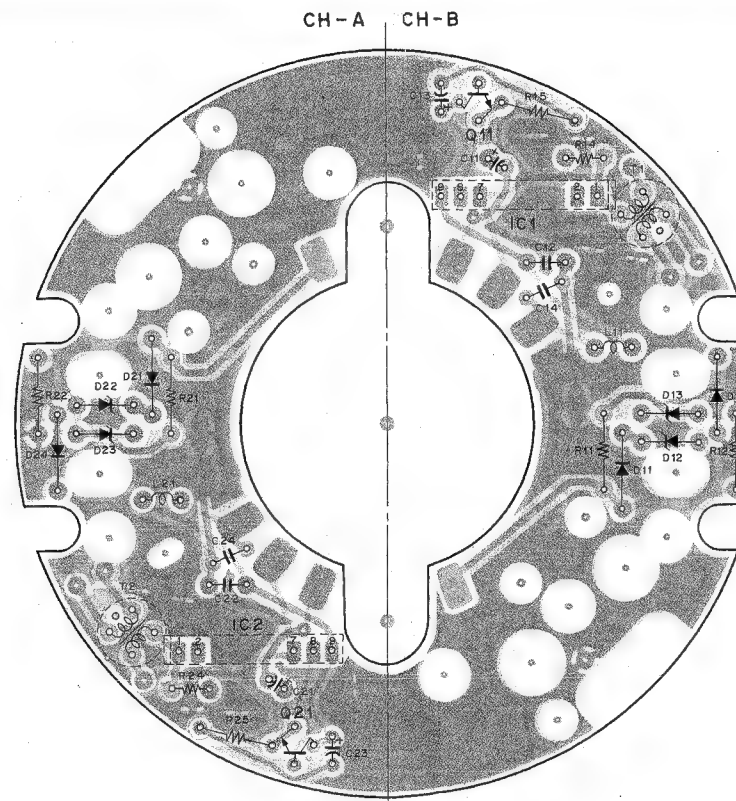
RP-10-1, DA-6

RP-10-1, DA-6

RP-10-1 (Y/C REC PB AMPLIFIER)  
(ROTARY ERASE AMPLIFIER)  
DA-6 (DT HEAD AMPLIFIER)



RP-10-SOLDERING SIDE -  
1-606-917-12



DA-6  
-COMPONENT SIDE -  
1-602-421-13  
BVU-820 (S/N.10651~(U/C)  
S/N.10201~(J))  
BVU-820P (S/N.10251~)  
BVU-820S (S/N.10051~)  
BVU-820PM (S/N.10006~)

CN1	J -3	RV1	G -2	T1	F -3
CN2	I -3	RV2	G -2	T2	D -3
CN3	H -2	RV3	E -3	T3	C -3
CN4	G -2	RV4	C -3	T4	D -4
CN5	E -2	RV5	E -4	T5	C -4
CN6	D -4	RV6	C -5	T101	H -3
CN7	B -2	RV7	C -2	T102	H -4
CN9	H -3	RV8	C -2		
		RV9	D -2	TP1	G -2
D1	F -4	RV10	D -2	TP2	G -2
D2	D -3	RV101	I -4	TP3	G -3
D3	F -4	RV102	I -3	TP4	F -2
D4	F -4			TP5	D -3
D101	I -2	Q3	E -3	TP6	D -3
D102	I -2	Q6	E -4	TP7	B -3
D103	I -5	Q7	D -2	TP8	D -4
D104	I -4	Q8	D -2	TP9	C -4
		Q9	D -2	TP10	B -4
E1	G -3	Q10	D -2	TP11	A -1
E2	F -2	Q51	B -4	TP12	A -2
E3	A -2	Q52	A -3	TP101	I -3
E101	J -3	Q53	A -5	TP102	H -3
		Q54	A -5	TP103	I -3
IC1	G -3	Q101	J -2	TP104	H -4
IC2	F -5	Q102	J -2	TP105	H -3
IC3	B -3	Q103	I -4		
IC4	B -4	Q104	J -3		
IC5	B -2	Q105	I -3		
IC6	B -2	Q106	I -2		
IC7	E -3	Q107	I -3		
IC8	E -5	Q108	J -4		
IC101	J -2	Q109	I -4		
		Q110	I -5		
		Q111	J -5		



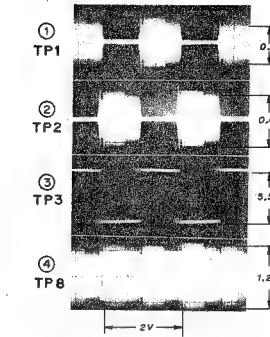
X1      G - 1

**YD-14**  
-SOLDERING SIDE-  
1-608-304-13,14  
BVU-820P (S/N.10301~)  
BVU-820S (S/N.10051~)



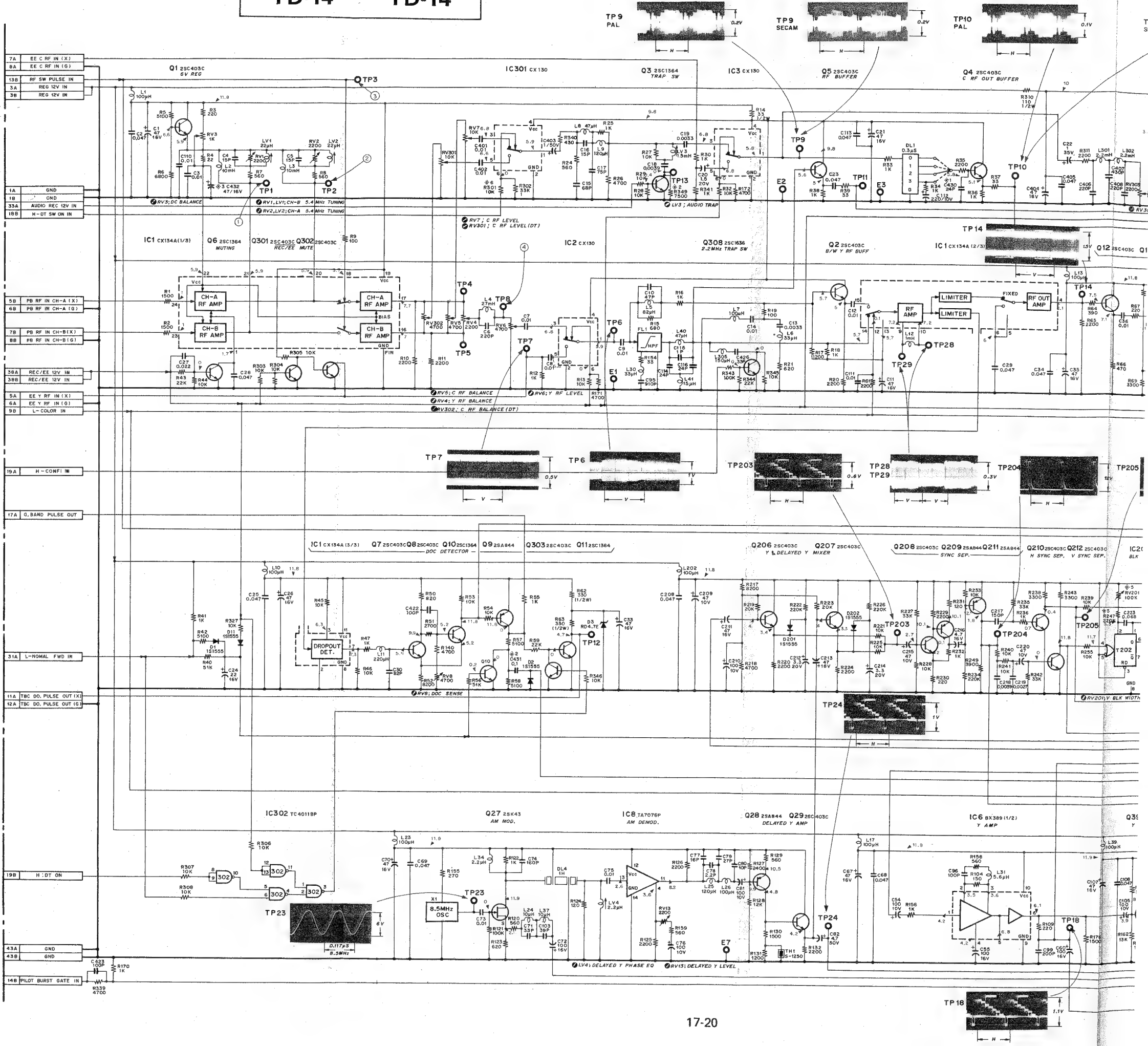
# YD-14 (Y DEMODULATOR)

YD-14 YD-14

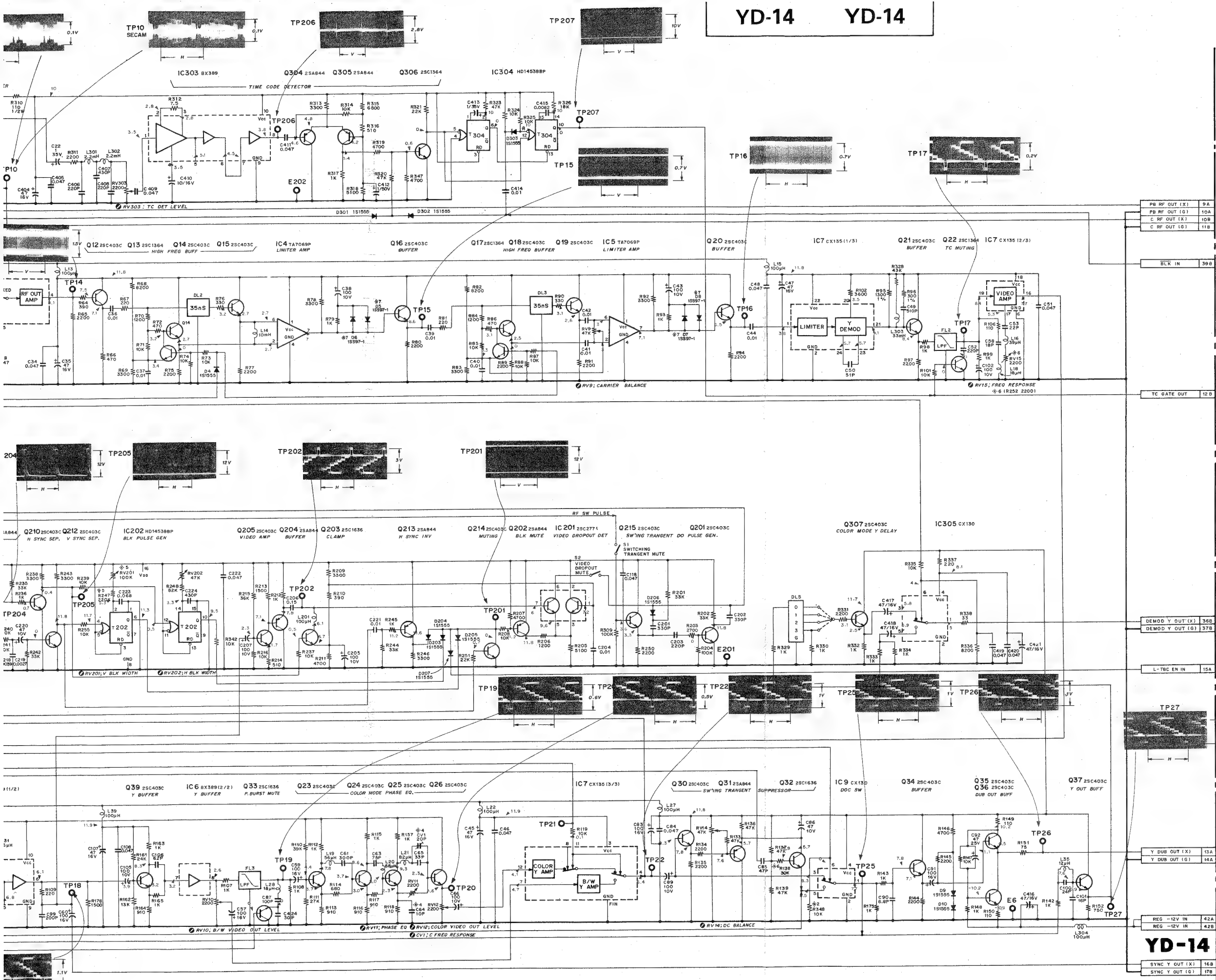


NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
*1	C430 24P ADDED	P:10041~ S:10001~
*2	C431 Q1 R348 10K ADDED R349 750Ω C64 19P → 27P (SEE MARK #4)	P:10171~ S:10001~ P:10301~ S:10051~
*3	C432 47/16V ADDED	P:10171~ S:10051~
*4	(C64 27P → 10P) (C61 20P ADDED)	P:10301~ S:10051~
*5	R247 270K → 220K RV201 47K → 100K	P:10051~ S:10051~
*6	R301 10K → 220K	P:10051~ S:10051~
	PV15 2200 → R252 2200	P:10051~ S:10051~
	R138 47K → 39K 39K → 30K 47K → 30K	P:10051~ S:10051~ S:10051~
*7	D5, D7 151925 → 15597-1	P:11193~ S:10118~







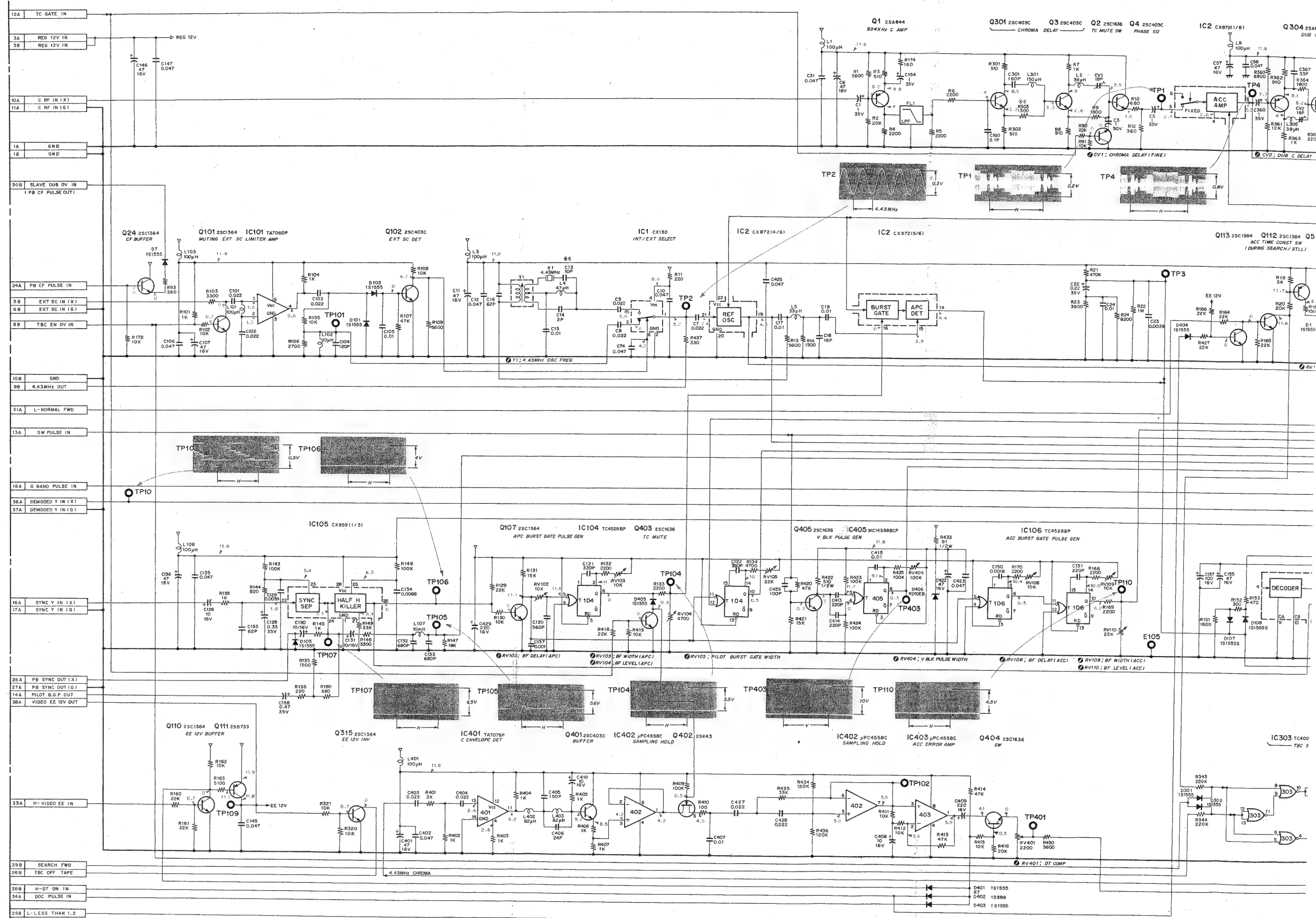
PB RF OUT (X)	9A
PB RF OUT (G)	10A
C RF OUT (X)	10B
C RF OUT (G)	11B
BLK IN	39B
TC GATE OUT	12B
DEMOD Y OUT (X)	36B
DEMOD Y OUT (G)	37B
L-TBC IN	15A
Y DUB OUT (X)	13A
Y DUB OUT (G)	14A
REG -12V IN	42A
REG -12V IN	42B
SYNC Y OUT (X)	16B
SYNC Y OUT (G)	17B

YD-14

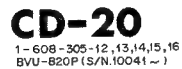
1-608-304-11,12,13,14  
8VU-820P  
8VU-820S



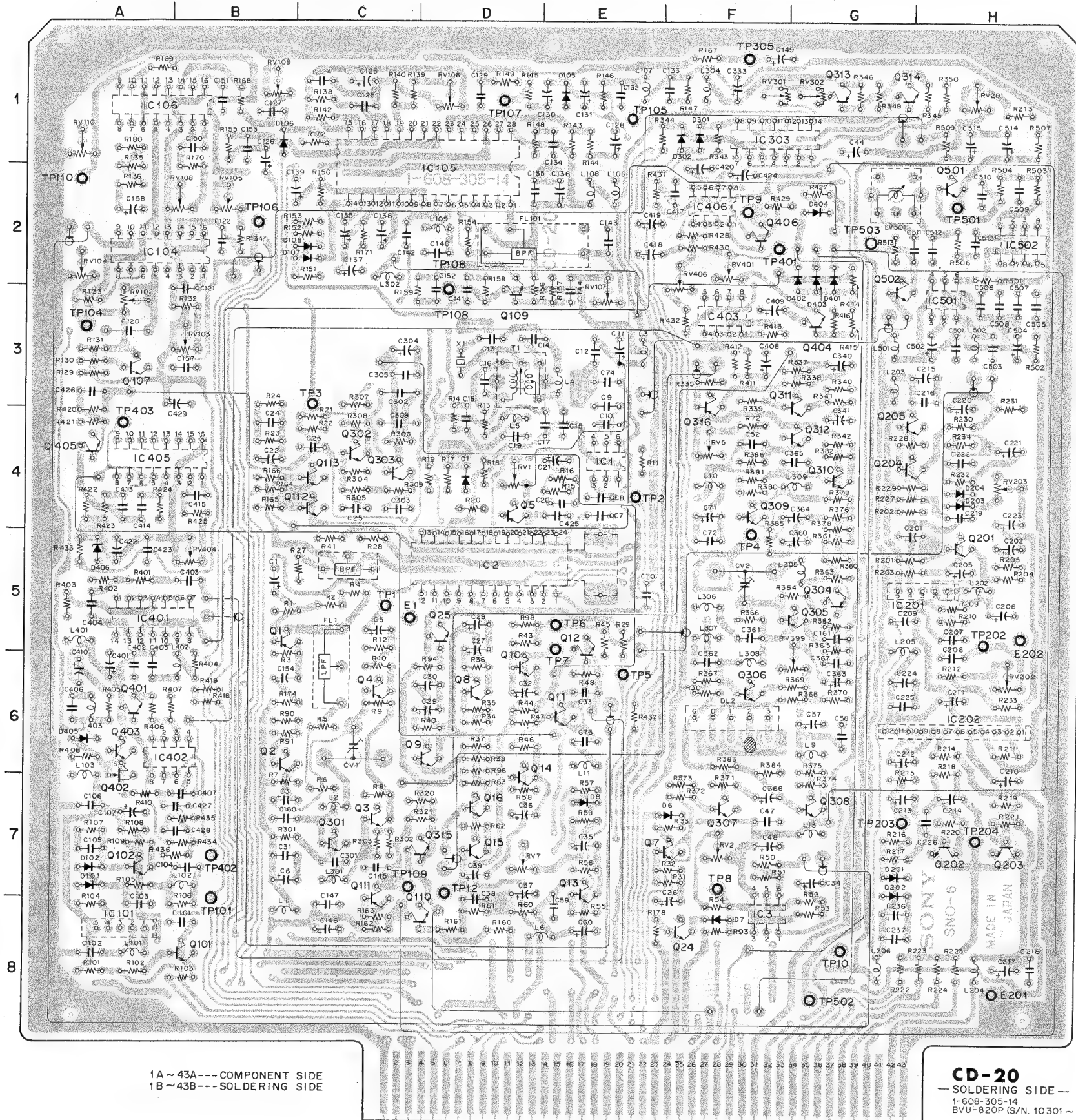
CD-20 (CHROMA DEMODULATOR)









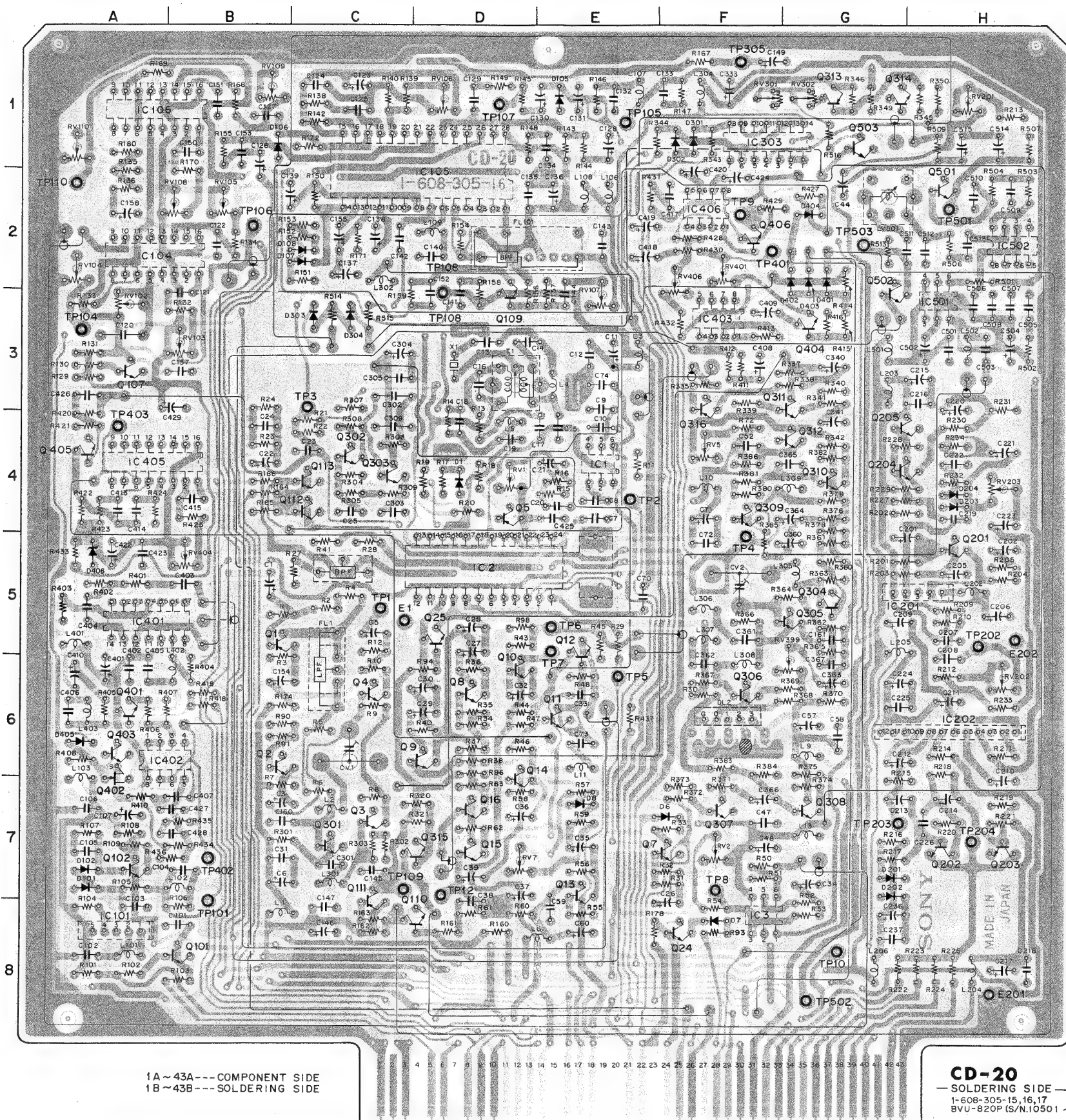


CV1	C - 6		Q308	G - 7
CV2	F - 5		Q309	F - 4
			Q310	G - 4
D1	D - 4		Q311	G - 4
D6	F - 7		Q312	G - 4
D7	F - 8		Q313	G - 1
D8	E - 7		Q314	G - 1
D101	A - 7		Q315	D - 7
D102	A - 7		Q316	F - 3
D105	E - 1		Q401	A - 6
D106	B - 1		Q402	A - 6
D107	C - 2		Q403	A - 6
D108	C - 2		Q404	G - 3
D201	G - 7		Q405	A - 4
D202	G - 7		Q406	F - 2
D203	H - 4		Q501	H - 2
D204	H - 4		Q502	G - 2
D301	F - 1			
D302	F - 1		RV1	D - 4
D401	G - 2		RV2	F - 7
D402	G - 2		RV5	F - 4
D403	G - 2		RV7	D - 7
D404	G - 2		RV102	A - 3
D405	A - 6		RV103	B - 3
D406	A - 5		RV104	A - 2
			RV105	B - 2
DL2	F - 6		RV106	D - 1
			RV107	E - 3
E201	H - 8		RV108	B - 2
E202	H - 5		RV109	B - 1
			RV110	A - 1
FL1	C - 5		RV201	H - 1
FL2	C - 5		RV202	H - 6
FL101	D - 2		RV203	H - 4
			RV301	F - 1
IC1	E - 4		RV302	G - 1
IC2	D - 5		RV399	G - 6
IC3	F - 8		RV401	F - 2
IC101	A - 8		RV404	B - 5
IC104	A - 2		RV406	F - 2
IC105	D - 1			
IC106	A - 1	T1	D - 3	
IC201	H - 5			
IC202	H - 6	TP1	C - 5	
IC303	F - 1	TP2	E - 4	
IC401	A - 5	TP3	C - 3	
IC402	A - 6	TP4	F - 4	
IC403	F - 3	TP5	E - 6	
IC405	A - 4	TP6	E - 5	
IC406	F - 2	TP7	E - 5	
IC501	H - 3	TP8	F - 7	
IC502	H - 2	TP9	F - 2	
		TP10	G - 8	
LV501	G - 2	TP12	D - 7	
		TP101	B - 8	
Q1	B - 5	TP104	A - 3	
Q2	B - 6	TP105	E - 1	
Q3	C - 7	TP106	B - 2	
Q4	C - 6	TP107	D - 1	
Q5	D - 4	TP108	D - 2	
Q7	F - 7	TP109	C - 7	
Q8	D - 6	TP110	A - 2	
Q9	D - 6	TP202	H - 5	
Q10	D - 6	TP203	H - 7	
Q11	E - 6	TP204	H - 7	
Q12	E - 5	TP305	F - 1	
Q13	E - 7	TP401	F - 2	
Q14	D - 6	TP402	A - 7	
Q15	D - 7	TP403	A - 4	
Q16	D - 7	TP501	H - 2	
Q24	F - 8	TP502	G - 8	
Q25	D - 5	TP503	G - 2	
Q101	B - 8			
Q102	A - 7	X1	D - 3	
Q107	A - 3			
Q109	D - 2			
Q110	D - 8			
Q111	C - 7			
Q112	C - 4			
Q113	C - 4			
Q201	H - 5			
Q202	H - 7			
Q203	H - 7			
Q204	H - 4			
Q205	H - 4			
Q301	C - 7			
Q302	C - 4			
Q303	C - 4			
Q304	G - 5			
Q305	G - 5			
Q306	F - 6			
Q307	F - 7			



**CD-20 (CHROMA DEMODULATOR)**

**Serial No. 10501 and higher**



17-27(b)

17-28(b)

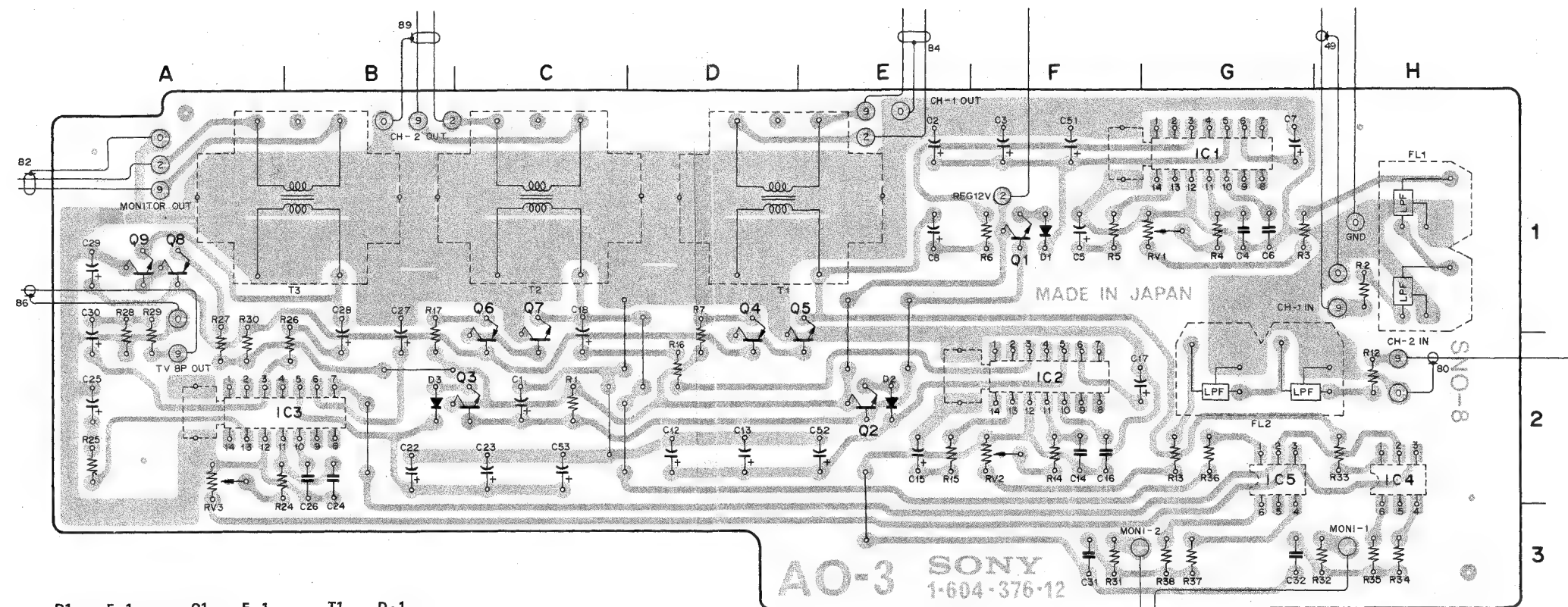
CV1	C - 6	O306	F - 6
DV2	F - 5	O307	F - 7
		O308	G - 4
D1	D - 4	O309	F - 7
D6	F - 7	O310	G - 4
D7	F - 8	O311	G - 3
D8	E - 7	O312	G - 4
D101	A - 7	O313	G - 1
D102	A - 7	O314	G - 4
D105	E - 1	O315	D - 7
D106	B - 1	O316	F - 3
D107	C - 2	O401	A - 6
D108	C - 2	O402	A - 6
D201	G - 7	O403	A - 6
D202	G - 7	O404	G - 3
D203	H - 4	O405	A - 4
D204	H - 4	O406	F - 2
D301	F - 1	Q501	H - 2
D302	F - 1	Q502	G - 2
D303	C - 3	Q503	G - 1
D304	C - 3		
D401	G - 2	RV1	D - 4
D402	G - 2	RV2	F - 7
D403	G - 2	RV5	F - 4
D404	G - 2	RV7	D - 7
D405	A - 6	RV102	A - 3
D406	A - 5	RV103	B - 3
		RV104	A - 2
DL2	F - 6	RV105	B - 2
		RV106	D - 1
E201	H - 8	RV107	E - 3
E202	H - 5	RV108	B - 2
		RV109	B - 1
FL1	C - 5	RV110	A - 1
FL2	C - 5	RV201	H - 1
FL101	D - 2	RV202	H - 6
		RV203	H - 4
IC1	E - 4	RV301	F - 1
IC2	D - 5	RV302	G - 1
IC3	F - 8	RV399	G - 6
IC101	A - 8	RV401	F - 2
IC104	A - 2	RV404	B - 5
IC105	D - 1	RV406	F - 2
IC106	A - 1		
IC201	H - 5	T1	D - 3
IC202	H - 6		
IC303	F - 1	TP1	C - 5
IC401	A - 5	TP2	E - 4
IC402	A - 6	TP3	C - 3
IC403	F - 3	TP4	F - 4
IC405	A - 4	TP5	E - 6
IC406	F - 2	TP6	E - 5
IC501	H - 3	TP7	E - 5
IC502	H - 2	TP8	F - 7
		TP9	F - 2
LV501	G - 2	TP10	G - 8
		TP12	D - 7
Q1	B - 5	TP101	B - 8
Q2	B - 6	TP104	A - 3
Q3	C - 7	TP105	E - 1
Q4	C - 6	TP106	B - 2
Q5	D - 4	TP107	D - 1
Q7	F - 7	TP108	D - 2
Q8	D - 6	TP109	C - 7
Q9	D - 6	TP110	A - 2
Q10	D - 6	TP202	H - 5
Q11	E - 6	TP203	H - 7
Q12	E - 5	TP204	H - 7
Q13	E - 7	TP305	F - 1
Q14	D - 6	TP401	F - 2
Q15	D - 7	TP402	A - 7
Q16	D - 7	TP403	A - 4
Q24	F - 8	TP501	H - 2
Q25	D - 5	TP502	G - 8
Q101	B - 8	TP503	G - 2
Q102	A - 7		
Q107	A - 3	X1	D - 3
Q109	D - 2		
Q110	D - 8		
Q111	C - 7		
Q112	C - 4		
Q113	C - 4		
Q201	H - 5		
Q202	H - 7		
Q203	H - 7		
Q204	H - 4		
Q205	H - 4		
Q301	C - 7		
Q302	C - 4		
Q303	C - 4		
Q304	G - 5		
Q305	G - 5		



AO-3 (AUDIO OUT)  
AO-2 (AUDIO OUT)  
HP-5 (HEADPHONE)

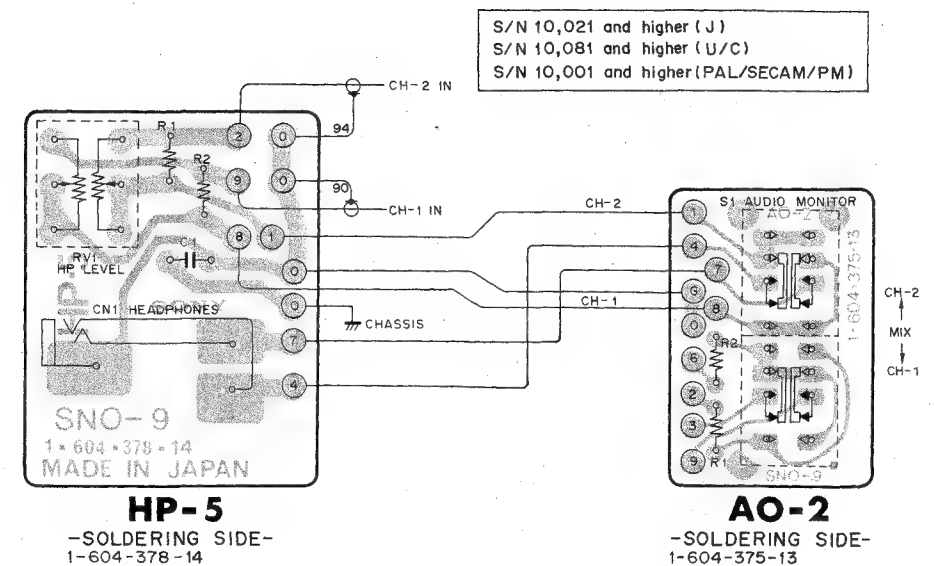
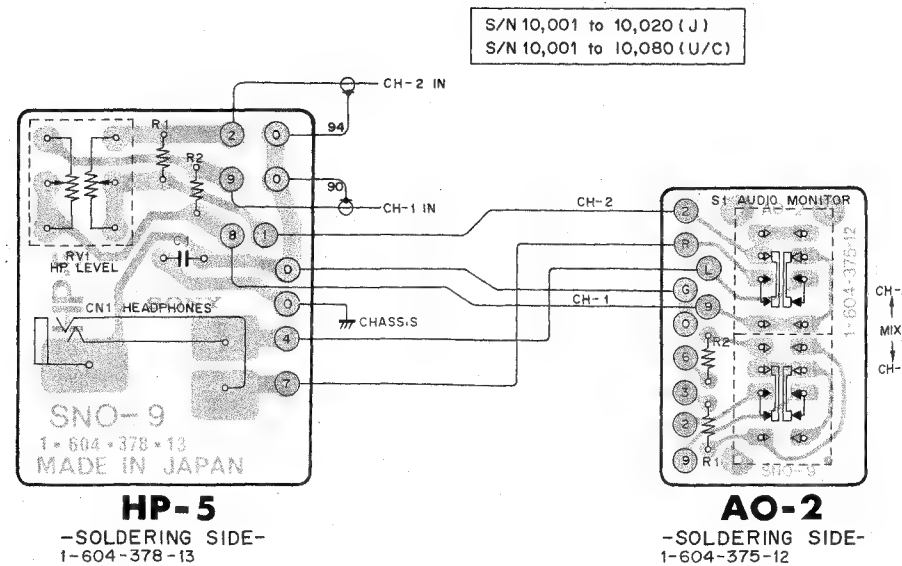


AO-3 (AUDIO OUTPUT AMPLIFIER)  
AO-2 (AUDIO OUTPUT SELECTOR)  
HP-5 (HEADPHONES)



D1	F-1	Q1	F-1	T1	D-1
D2	E-2	Q2	E-2	T2	C-1
D3	B-2	Q3	C-2	T3	B-1
FL1	H-1	Q5	E-2		
FL2	G-2	Q6	C-2		
		Q7	C-2		
IC1	G-1	Q8	A-1		
IC2	F-2	Q9	A-1		
IC3	A-2				
IC4	H-2	RV1	G-1		
IC5	G-2	RV2	F-2		
		RV3	A-2		

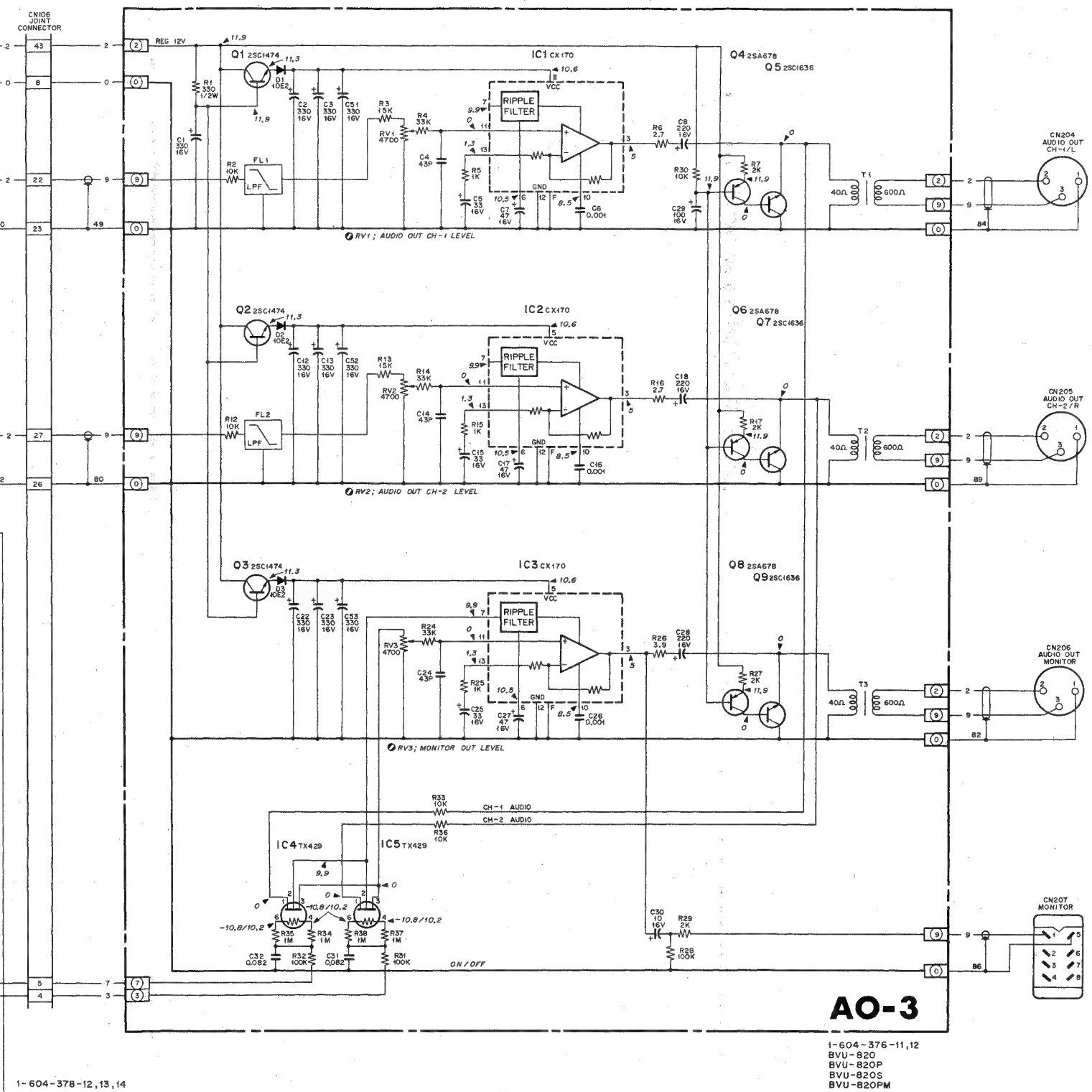
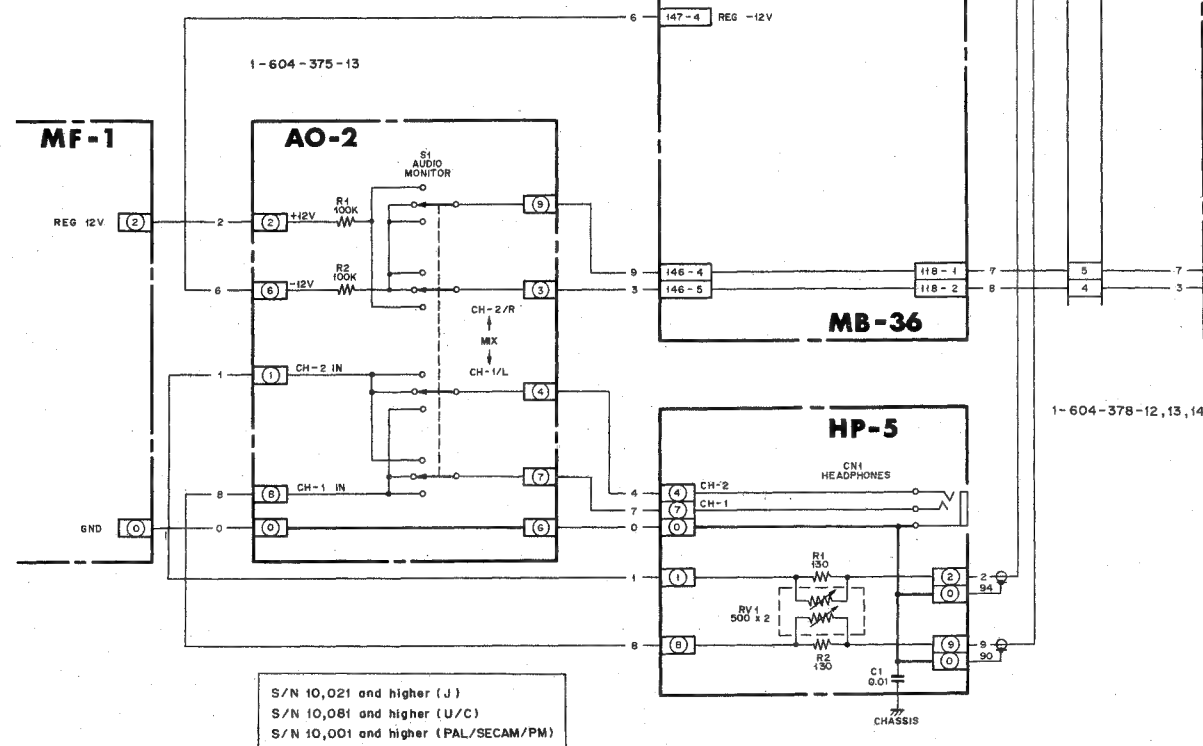
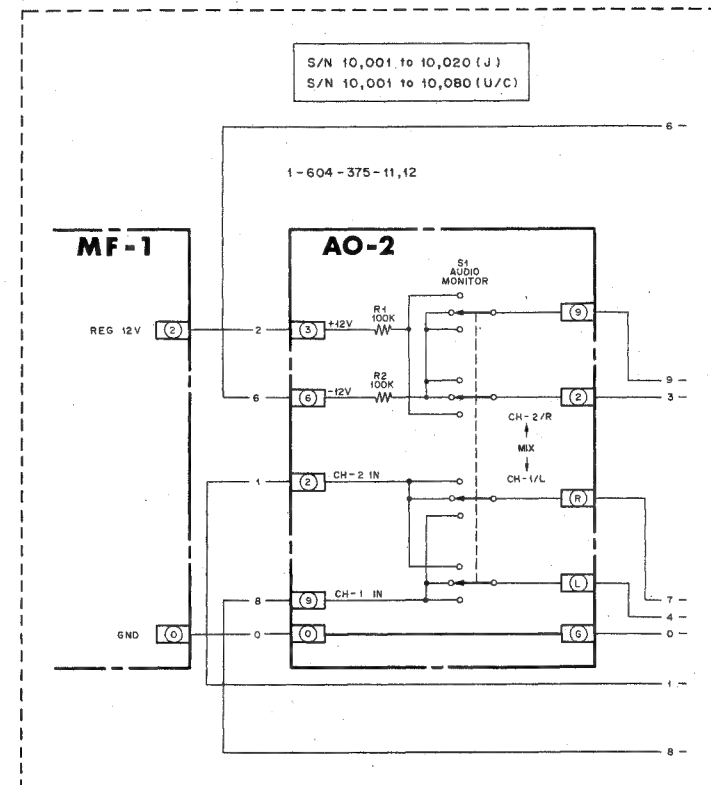
**AO-3 -SOLDERING SIDE-**  
1-604-376-12  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM





AO-3, AO-2, HP-5      AO-3, AO-2, HP-5

AO-3 (AUDIO OUTPUT AMPLIFIER)  
AO-2 (AUDIO OUTPUT SELECTOR)  
HP-5 (HEADPHONES)

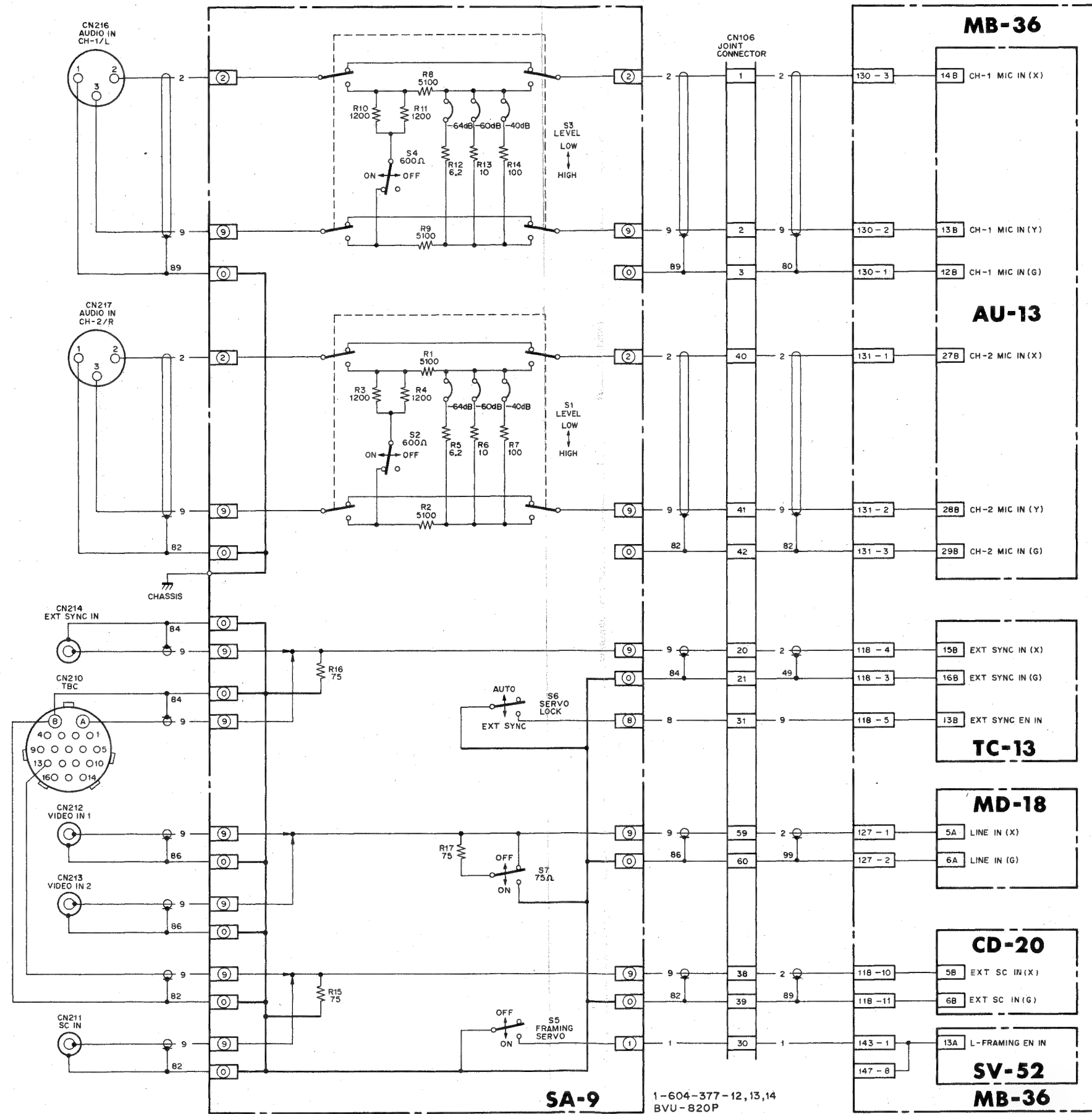




SA-9

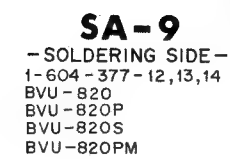
SA-9

**SA-9 (SYSTEM SELECT SWITCH)  
(AUDIO INPUT LEVEL SELECT)**

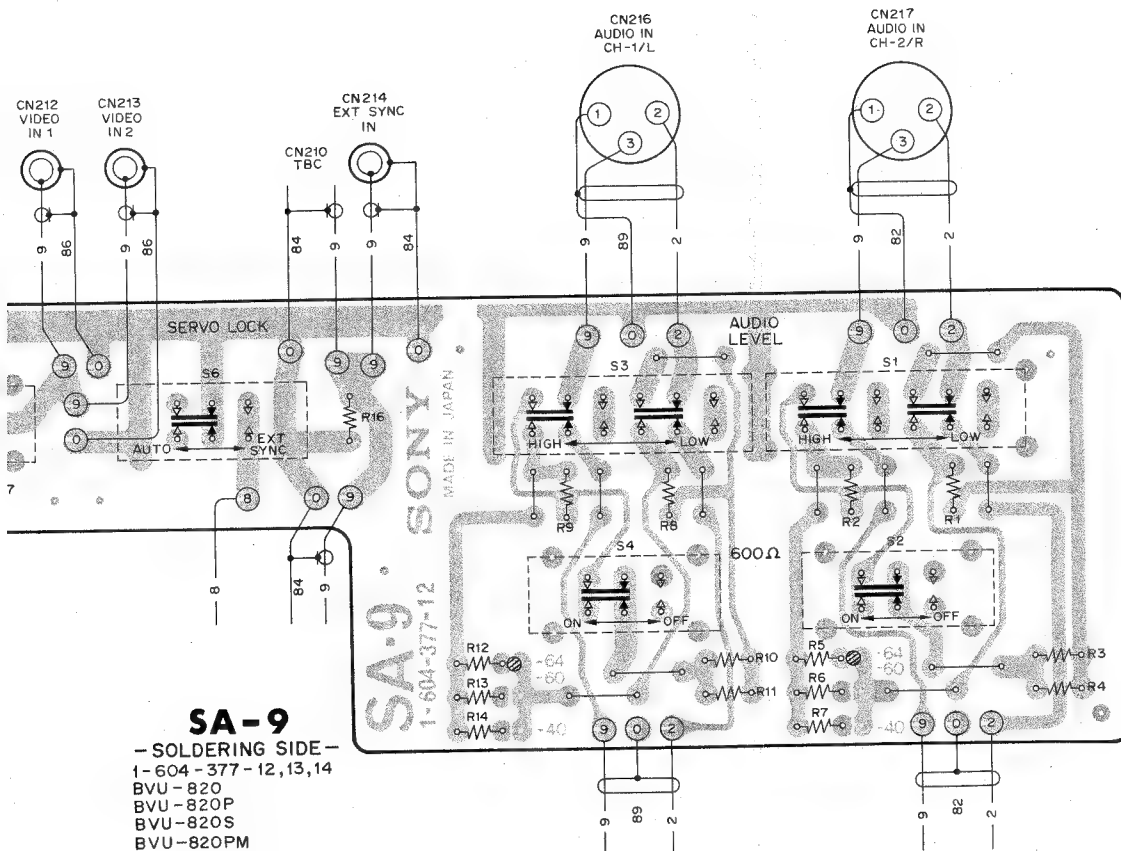




(AUDIO INPUT LEVEL SELECT)



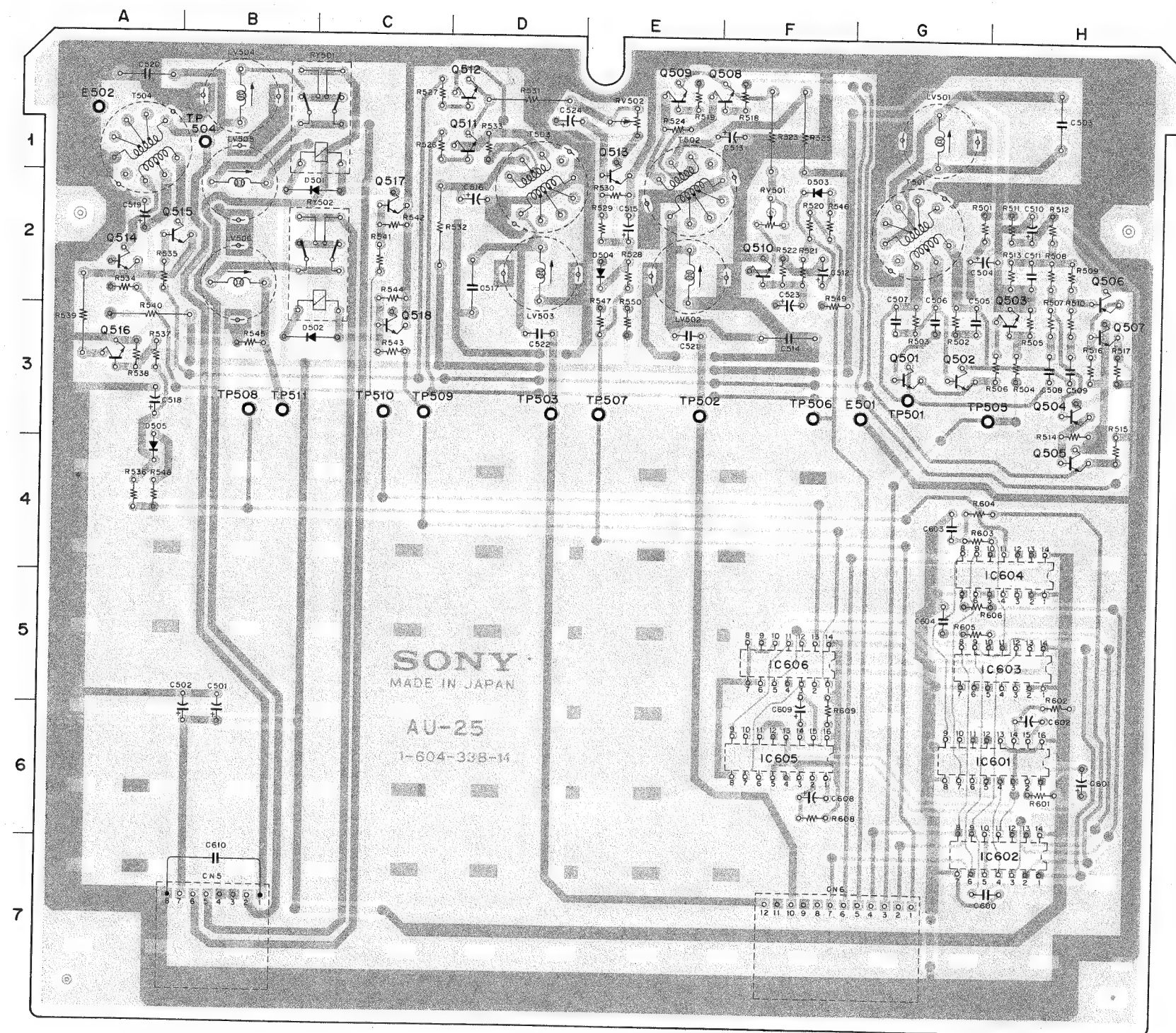






AU-13 (AUDIO REC/PB AMPLIFIER)  
(AUDIO SYSTEM CONTROL)  
AU-25 (BIAS/ERASE OSCILLATOR)

SER. NO. 10221 to 10400 (PAL)  
SER. NO. 10001 to 10050 (SECAM)



CN5 B-7  
CN6 F-7

D501 B-2  
D502 B-3  
D503 F-2  
D504 E-2  
D505 A-4

E501 G-3  
E502 A-1

IC601 H-6  
IC602 H-7  
IC603 H-5  
IC604 H-4  
IC605 F-6  
IC606 F-5

LV501 G-1  
LV502 E-2  
LV503 D-2  
LV504 B-1  
LV505 B-2  
LV506 B-2

Q501 G-3  
Q502 G-3  
Q503 H-3  
Q504 H-3  
Q505 H-4  
Q506 H-2  
Q507 H-3  
Q508 F-1  
Q509 E-1  
Q510 F-2  
Q511 D-1  
Q512 D-1  
Q513 E-1  
Q514 A-2  
Q515 A-2  
Q516 A-3  
Q517 C-2  
Q518 C-3

RV501 F-2  
RV502 E-1

RY501C-1  
RY502C-2

T501 G-2  
T502 E-2  
T503 D-2  
T504 A-1

TP501 G-3  
TP502 E-3  
TP503 D-3  
TP504 B-1  
TP505 H-3  
TP506 F-3  
TP507 E-3  
TP508 B-3  
TP509 C-3  
TP510 C-3  
TP511 B-3

**AU-25 - SOLDERING SIDE -**

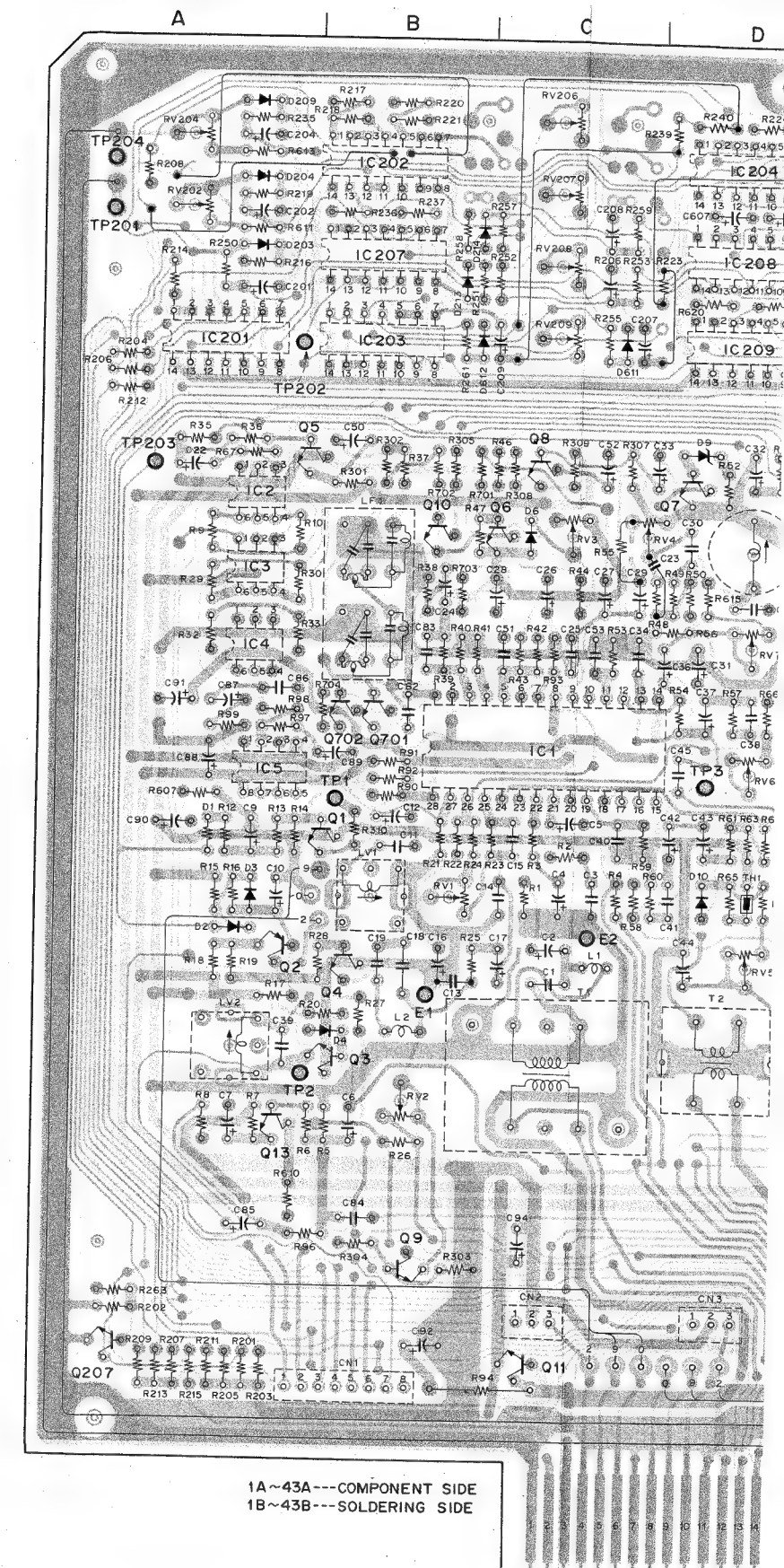
1-604-338-14

BUU-820 (S/N. 10201~10645 (U/C))

BUU-820P (S/N. 10151~10200 (J))

BUU-820S (S/N. 10221~10400)

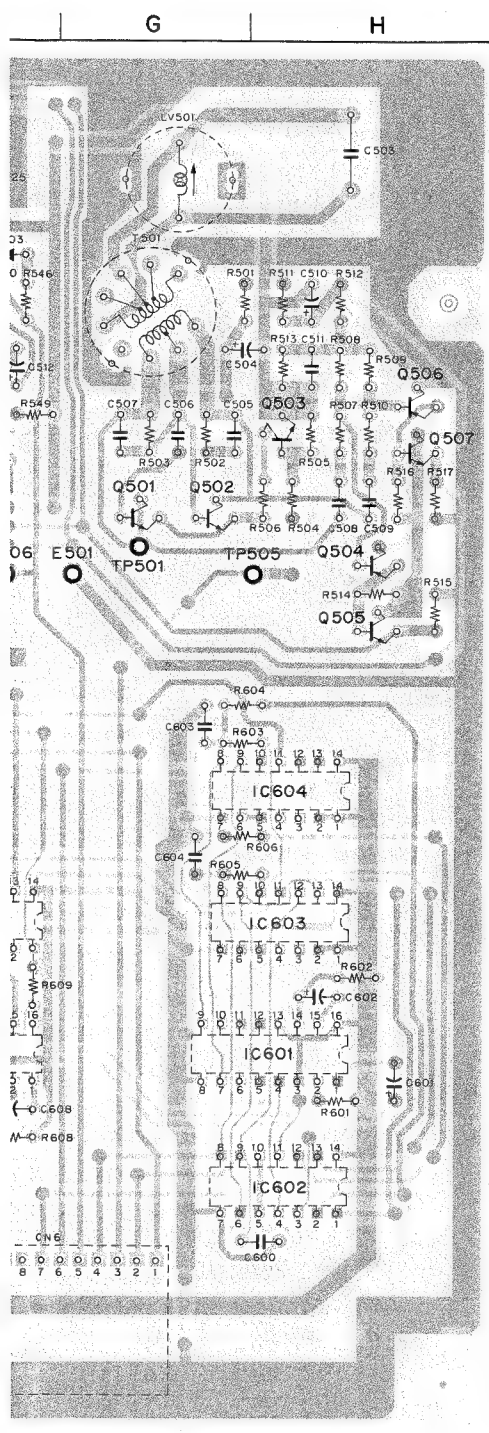
BUU-820PM (S/N. 10001~10050)



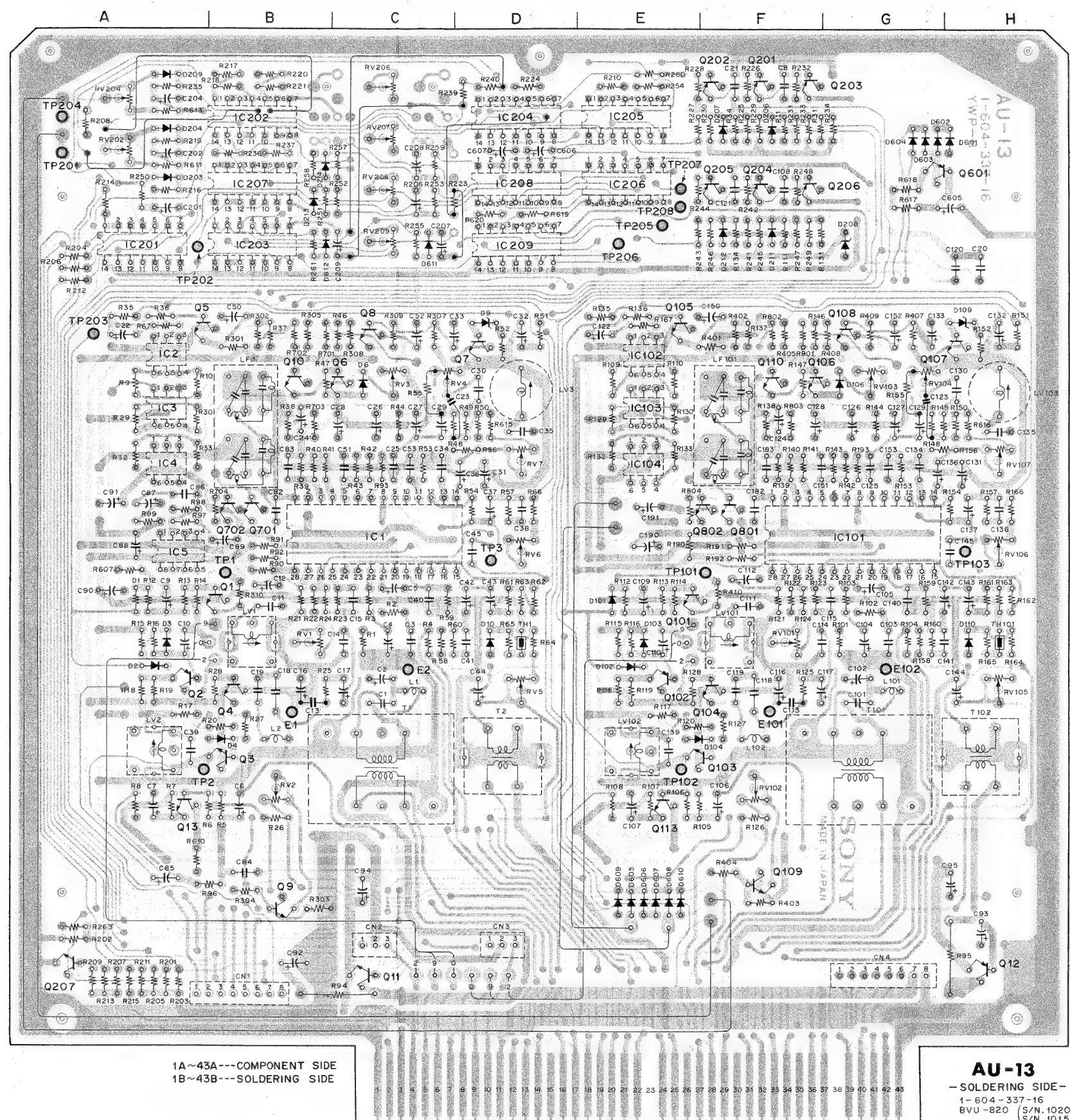
1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE



**AU-13, AU-25**



**AU-25** -SOLDERING SIDE-  
1-604-338-14  
BVU-820 (S/N. 10201~10645 (U/C))  
S/N. 10151~10200 (J))  
BVU-820P S/N. 10221~10400  
BVU-820S S/N. 10001~10050  
BVU-820PM S/N. 10001~10005



1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE

**AU-13**  
— SOLDERING SIDE —  
1-604-337-16  
BVU-820 (S/N. 10201~10645 (U/C)  
S/N. 10151~10200 (J))  
BVU-820P (S/N. 10221~10400)  
BVU-820S (S/N. 10001~10050)  
BVU-820PM (S/N. 10001~10005)

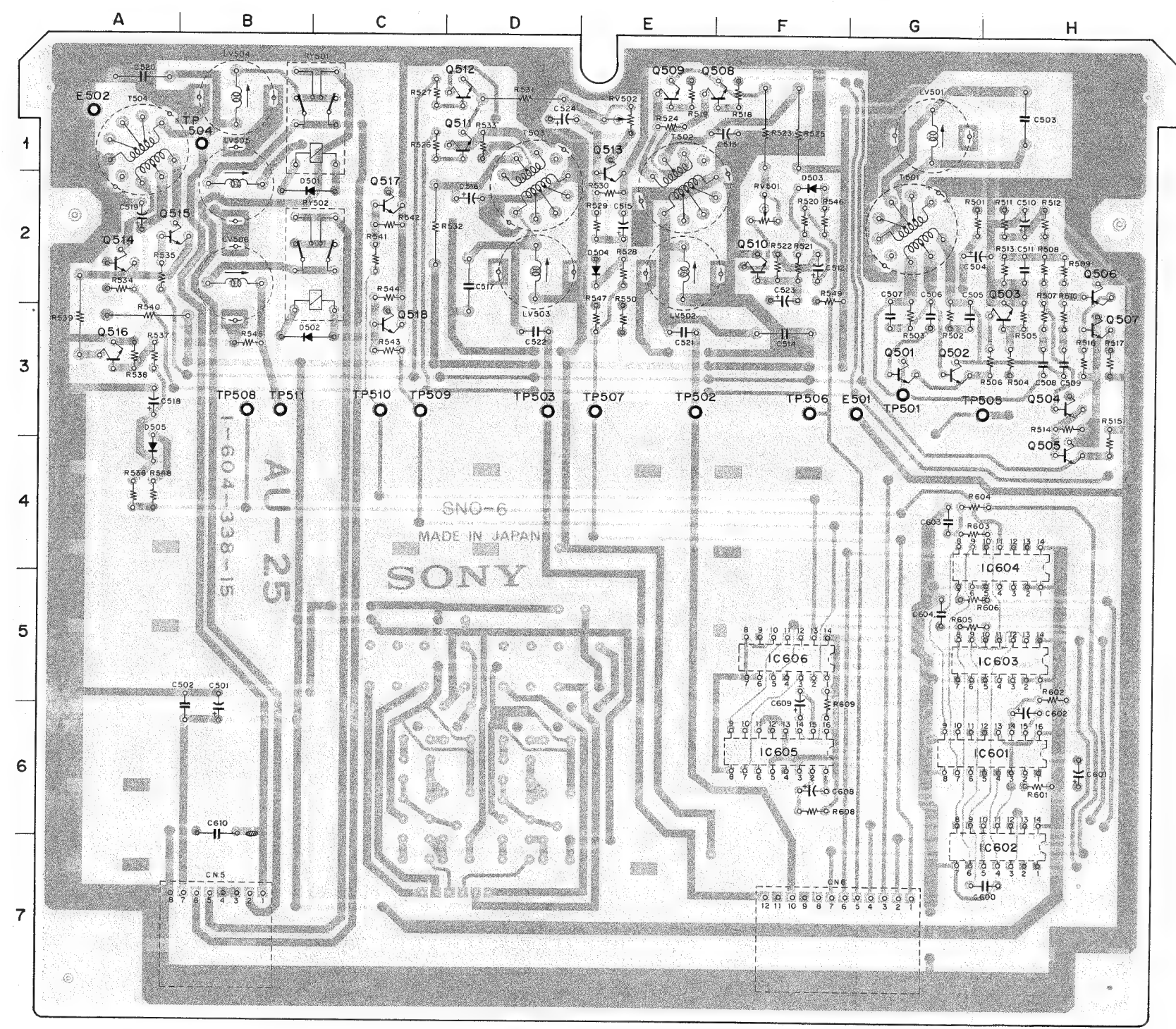
CN3	D - 8	Q1	B - 5
CN4	G - 8	Q2	A - 6
		Q3	B - 7
D1	A - 5	Q4	B - 6
D2	A - 6	Q5	A - 3
D3	A - 6	Q6	C - 3
D4	B - 6	Q7	D - 3
D6	C - 3	Q8	C - 3
D9	D - 3	Q9	B - 8
D10	D - 6	Q10	B - 8
D101	E - 5	Q11	C - 3
D102	E - 6	Q12	H - 8
D103	E - 6	Q13	A - 7
D104	F - 6	Q101	E - 6
D106	G - 3	Q102	E - 6
D109	H - 3	Q103	F - 7
D110	H - 6	Q104	F - 6
D203	A - 2	Q105	C - 3
D204	A - 1	Q106	F - 3
D206	F - 1	Q107	H - 3
D207	F - 1	Q108	G - 3
D208	G - 2	Q109	F - 8
D209	A - 1	Q201	F - 1
D211	F - 2	Q202	F - 1
D212	F - 2	Q203	F - 1
D213	B - 2	Q204	F - 2
D214	B - 2	Q205	F - 2
D601	H - 1	Q206	F - 2
D602	G - 1	Q207	A - 8
D603	G - 1	Q601	G - 2
D604	G - 1	Q701	B - 4
D605	E - 8	Q702	B - 4
D606	E - 8	Q801	F - 4
D607	E - 8	Q802	F - 4
D608	E - 8		
D609	E - 8	RV1	B - 6
D610	E - 8	RV2	B - 7
D611	C - 2	RV3	C - 3
D612	B - 2	RV4	C - 3
		RV5	D - 6
E1	B - 6	RV6	D - 5
E2	C - 6	RV7	D - 4
E101	F - 6	RV101	F - 6
E102	G - 6	RV102	F - 7
		RV103	G - 3
IC1	C - 5	RV104	G - 3
IC2	A - 3	RV105	H - 5
IC3	A - 4	RV106	H - 6
IC4	A - 4	RV107	H - 4
IC5	A - 5	RV202	A - 1
IC101	G - 5	RV204	A - 1
IC102	E - 3	RV206	C - 1
IC103	E - 4	RV207	C - 1
IC104	E - 4	RV208	C - 2
IC201	A - 2	RV209	C - 2
IC202	B - 1		
IC203	B - 2		
IC204	D - 1	T1	C - 7
IC205	E - 1	T101	G - 7
IC206	E - 2	T102	H - 6
IC207	B - 2		
IC208	D - 2		
IC209	D - 2	TH1	D - 6
		TH101	H - 6
LF1	B - 4	TP1	B - 5
LF101	F - 4	TP2	A - 7
		TP3	D - 5
LV1	B - 6	TP101	F - 5
LV2	A - 6	TP102	E - 7
LV3	D - 3	TP103	H - 5
LV101	F - 6	TP201	A - 1
LV102	E - 6	TP202	A - 2
LV103	H - 3	TP203	A - 3
		TP204	A - 1
		TP205	E - 2
		TP206	E - 2
		TP207	E - 2
		TP208	E - 2



AU-13 (AUDIO REC/PB AMPLIFIER)  
(AUDIO SYSTEM CONTROL)

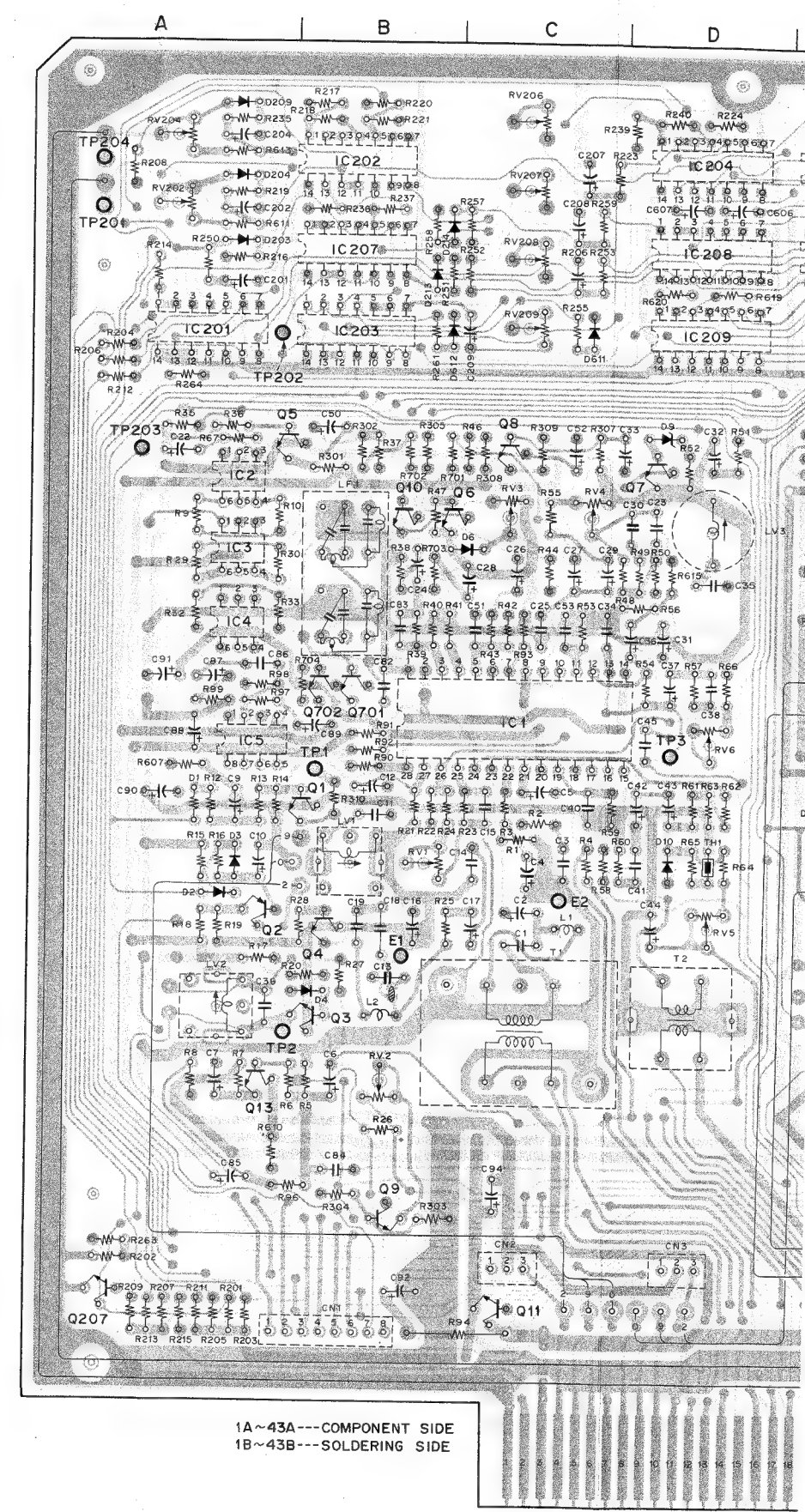
AU-25 (BIAS/ERASE OSCILLATOR)

SER. NO. 10401 and higher (PAL)  
SER. NO. 10051 and higher (SECAM)



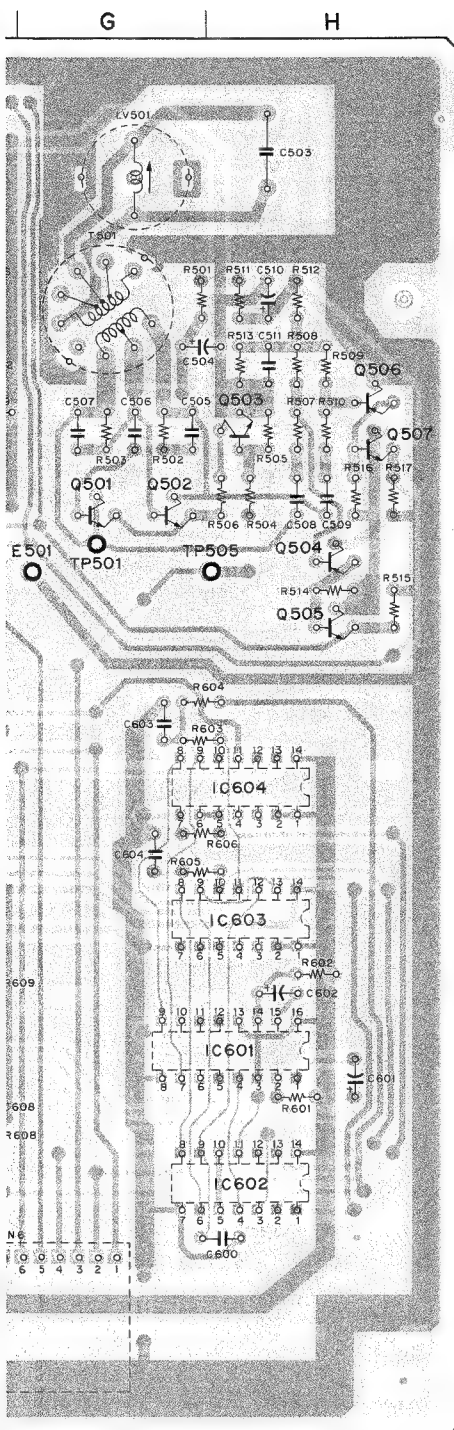
**AU-25 -SOLDERING SIDE-**  
1-604-338-15  
BVU-820 (S/N.10646~(U/C))  
BVU-820P S/N.10401~(J)  
BVU-820S S/N.10051~  
BVU-820PM S/N.10006~

- CN5 B - 7
- CN6 F - 7
- D501 B - 2
- D502 B - 3
- D503 F - 2
- D504 E - 2
- D505 A - 4
- E501 G - 3
- E502 A - 1
- IC601 H - 6
- IC602 H - 7
- IC603 H - 5
- IC604 H - 4
- IC605 F - 6
- IC606 F - 5
- LV501 G - 1
- LV502 E - 2
- LV503 D - 2
- LV504 B - 1
- LV505 H - 2
- LV506 B - 2
- Q501 G - 3
- Q502 G - 3
- Q503 H - 3
- Q504 H - 3
- Q505 H - 4
- Q506 H - 2
- Q507 H - 3
- Q508 F - 1
- Q509 E - 1
- Q510 F - 2
- Q511 D - 1
- Q512 D - 1
- Q513 E - 1
- Q514 A - 2
- Q515 A - 2
- Q516 A - 3
- Q517 C - 2
- Q518 C - 3
- RV501 F - 2
- RV502 E - 1
- RY501 C - 1
- RY502 C - 2
- T501 G - 2
- T502 E - 2
- T503 D - 2
- T504 A - 1
- TP501 G - 3
- TP502 E - 3
- TP503 D - 3
- TP504 B - 1
- TP505 H - 3
- TP506 F - 3
- TP507 E - 3
- TP508 B - 3
- TP509 C - 3
- TP510 C - 3
- TP511 B - 3

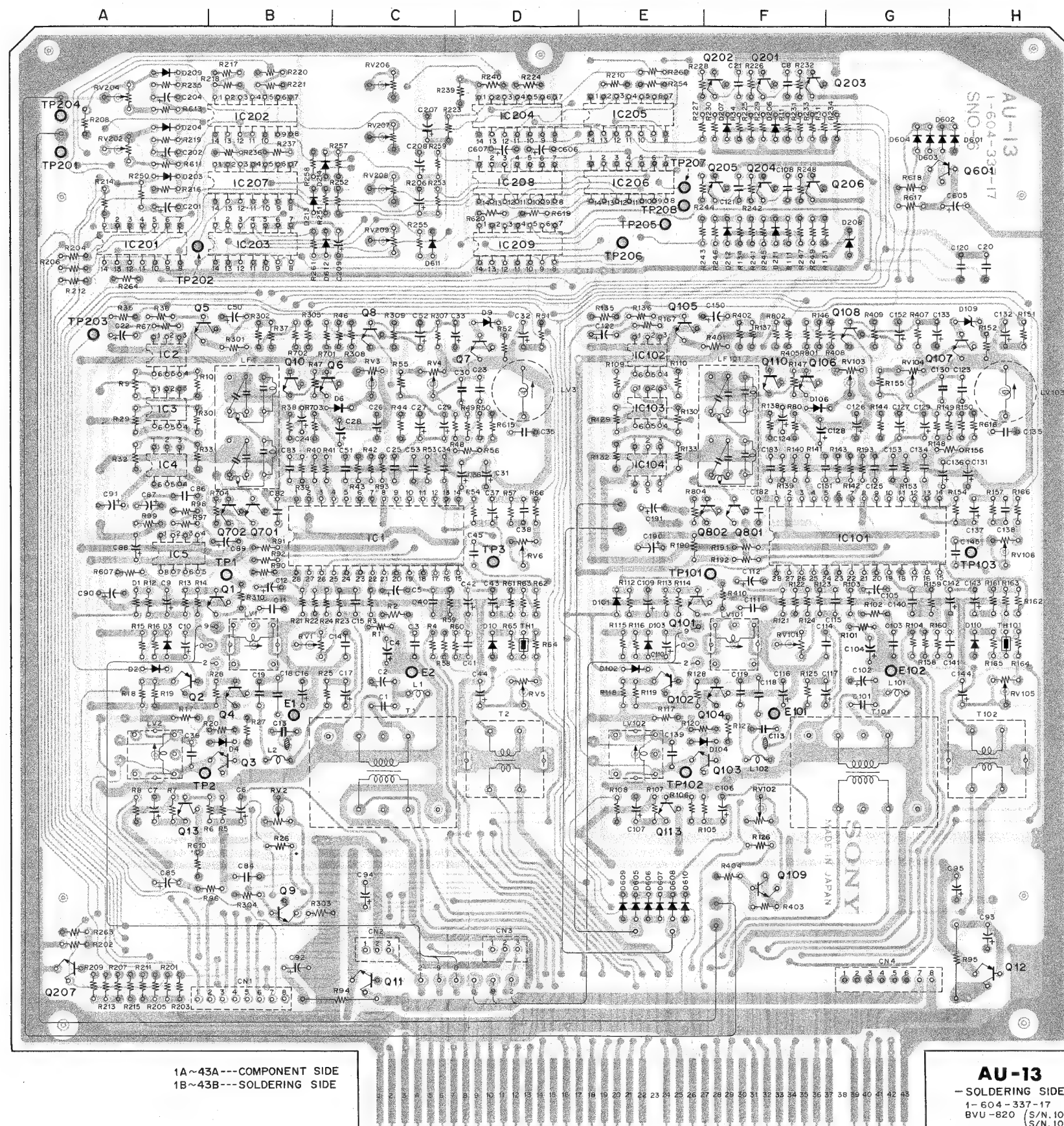


1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE





**AU-25** - SOLDERING SIDE -  
1-604-338-15  
BVU-820 (S/N.10646 ~ (U/C)  
S/N.10201 ~ (J)  
BVU-820P S/N.10401 ~  
BVU-820S S/N.10051 ~  
BVU-820PM S/N.10006 ~



1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE

**AU-13**  
- SOLDERING SIDE -  
1-604-337-17  
BVU-820 (S/N. 10646~(U/C)  
S/N. 10201~(J))  
BVU-820P (S/N. 10401~)  
BVU-820S (S/N. 10051~)  
BVU-820PM (S/N. 10006~)

CN3	D - 8	Q1	B - 5
CN4	G - 8	Q2	A - 6
		Q3	B - 7
D1	A - 5	Q4	B - 6
D2	A - 6	Q5	A - 3
D3	A - 6	Q6	C - 3
D4	B - 6	Q7	C - 3
D6	C - 4	Q8	C - 3
D9	D - 3	Q9	B - 6
D10	D - 6	Q10	D - 3
D101	E - 5	Q11	C - 8
D102	E - 6	Q12	H - 8
D103	E - 6	Q13	A - 7
D104	F - 6	Q101	E - 7
D106	F - 4	Q102	E - 6
D109	H - 3	Q103	F - 7
D110	H - 6	Q104	F - 6
D203	A - 2	Q105	C - 3
D204	A - 1	Q106	F - 3
D206	F - 1	Q107	H - 3
D207	F - 1	Q108	G - 3
D208	G - 2	Q109	F - 8
D209	A - 1	Q201	F - 1
D211	F - 2	Q202	F - 1
D212	F - 2	Q203	F - 1
D213	B - 2	Q204	F - 2
D214	B - 2	Q205	F - 2
D601	H - 1	Q206	F - 2
D602	G - 1	Q207	A - 8
D603	G - 1	Q601	G - 2
D604	G - 1	Q701	B - 4
D605	E - 8	Q702	B - 4
D606	E - 8	Q801	F - 4
D607	E - 8	Q802	F - 4
D608	E - 8		
D609	E - 8	RV1	B - 6
D610	E - 8	RV2	B - 7
D611	C - 2	RV3	C - 3
D612	B - 2	RV4	C - 3
		RV5	D - 6
E1	B - 6	RV6	F - 5
E2	C - 6	RV101	D - 6
E101	F - 6	RV102	F - 7
E102	G - 6	RV103	G - 3
		RV104	G - 3
IC1	C - 5	RV105	H - 6
IC2	A - 3	RV106	H - 5
IC3	A - 4	RV202	A - 1
IC4	A - 4	RV204	A - 1
IC5	A - 5	RV206	C - 1
IC101	G - 5	RV207	C - 1
IC102	E - 3	RV208	C - 2
IC103	E - 4	RV209	C - 2
IC104	E - 4		
IC201	A - 2	T1	C - 7
IC202	B - 1	T2	D - 6
IC203	B - 2	T101	G - 7
IC204	D - 1	T102	H - 6
IC205	E - 1		
IC206	E - 2	TH1	D - 6
IC207	B - 2	TH101	H - 6
IC208	D - 2		
IC209	D - 2	TP1	B - 5
		TP2	A - 7
LF1	B - 4	TP3	D - 5
LF101	F - 4	TP101	F - 5
		TP102	E - 7
LV1	B - 6	TP103	H - 5
LV2	A - 6	TP201	A - 1
LV3	D - 3	TP202	A - 2
LV101	F - 6	TP203	A - 3
LV102	E - 6	TP204	A - 1
LV103	H - 3	TP205	E - 2
		TP206	E - 2
		TP207	E - 2
		TP208	E - 2



AU-13 (AUDIO REC/PB AMPLIFIER)  
(AUDIO SYSTEM CONTROL)  
AU-25 (BIAS/ERASE OSCILLATOR)

AU-13, AU-25 AU-13, AU-25

NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
*1	C25,C125 0.001 ADDED C35,C135 0.002 → 0.018 LV5,LV105 3.3M → 4.7M R24,R24 10K → 470K RV1,RV101 10K → 47K	U/C:10351 ~ J:10201 ~ P:10221 ~ S:10001 ~ PM:10001 ~

NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
*2	C13,C113 0.002 ADDED ADD OR DELETE/SELECTABLE C610 270P ADDED	U/C:10351 ~ J:10201 ~ P:10221 ~ S:10001 ~ PM:10001 ~

NOTE

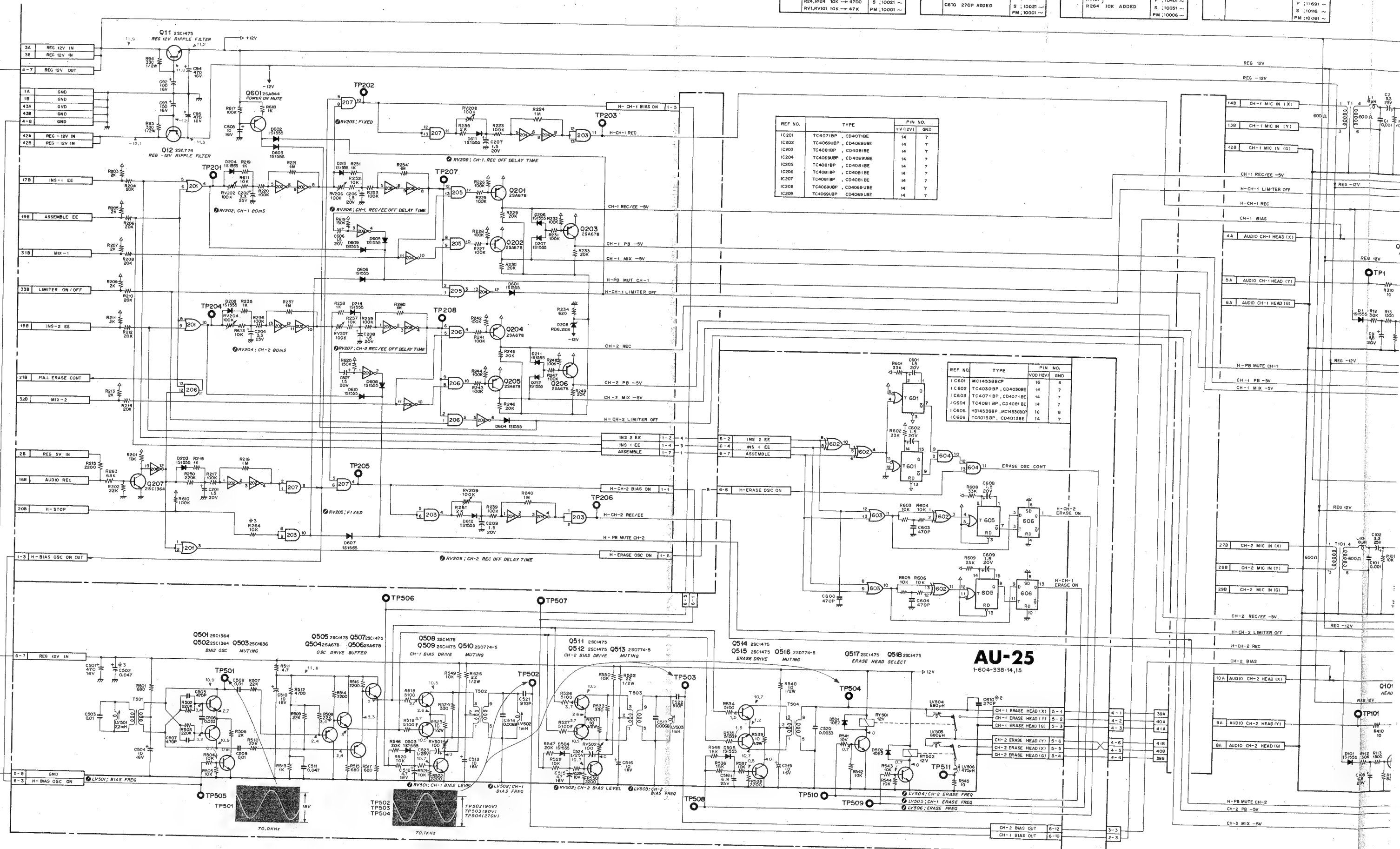
MARK	CHANGE INFORMATION	SERIAL NO.
*3	C502 10/16V → 0.047 RV7 RV107 R264 10K ADDED	U/C:10645 ~ J:10201 ~ P:10401 ~ S:10051 ~ PM:10006 ~

NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
*4	D10,110 151925 → 15597-1	U/C:12124 ~ J:10631 ~ P:11691 ~ S:10116 ~ PM:10081 ~

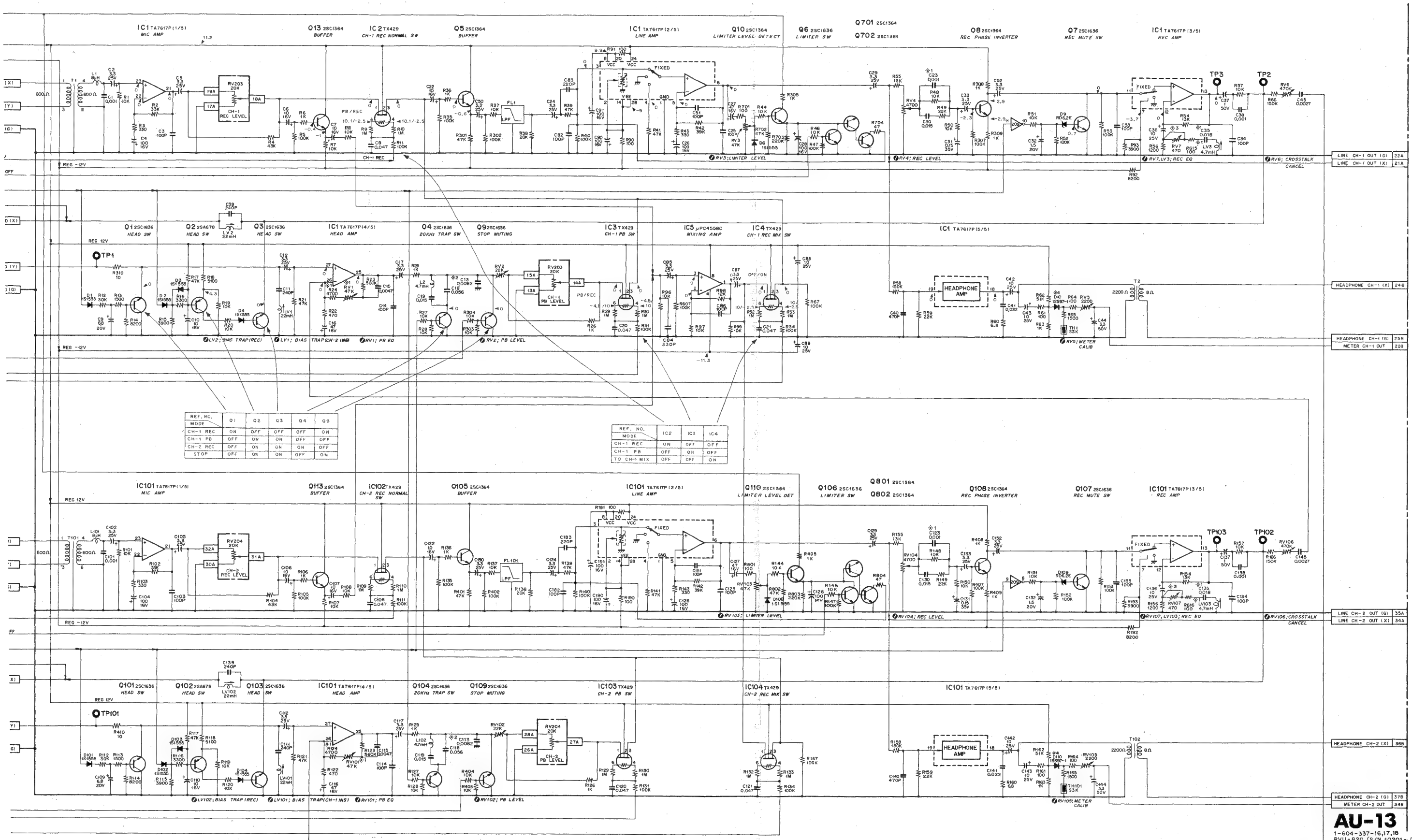
REF NO.	TYPE	PIN NO.
IC201	TC4071BP, CD4071BE	14 7
IC202	TC4069UBP, CD4069UBE	14 7
IC203	TC4081BP, CD4081BE	14 7
IC204	TC4069UBP, CD4069UBE	14 7
IC205	TC4081BP, CD4081BE	14 7
IC206	TC4081BP, CD4081BE	14 7
IC207	TC4081BP, CD4081BE	14 7
IC208	TC4069UBP, CD4069UBE	14 7
IC209	TC4069UBP, CD4069UBE	14 7

REF NO.	TYPE	PIN NO.
IC601	MC145388CP	16 8
IC602	TC4030BP, CD4030BE	14 7
IC603	TC4071BP, CD4071BE	14 7
IC604	TC4081BP, CD4081BE	14 7
IC605	MC145388CP, MC145388CP	16 8
IC606	TC4071BP, CD4071BE	14 7





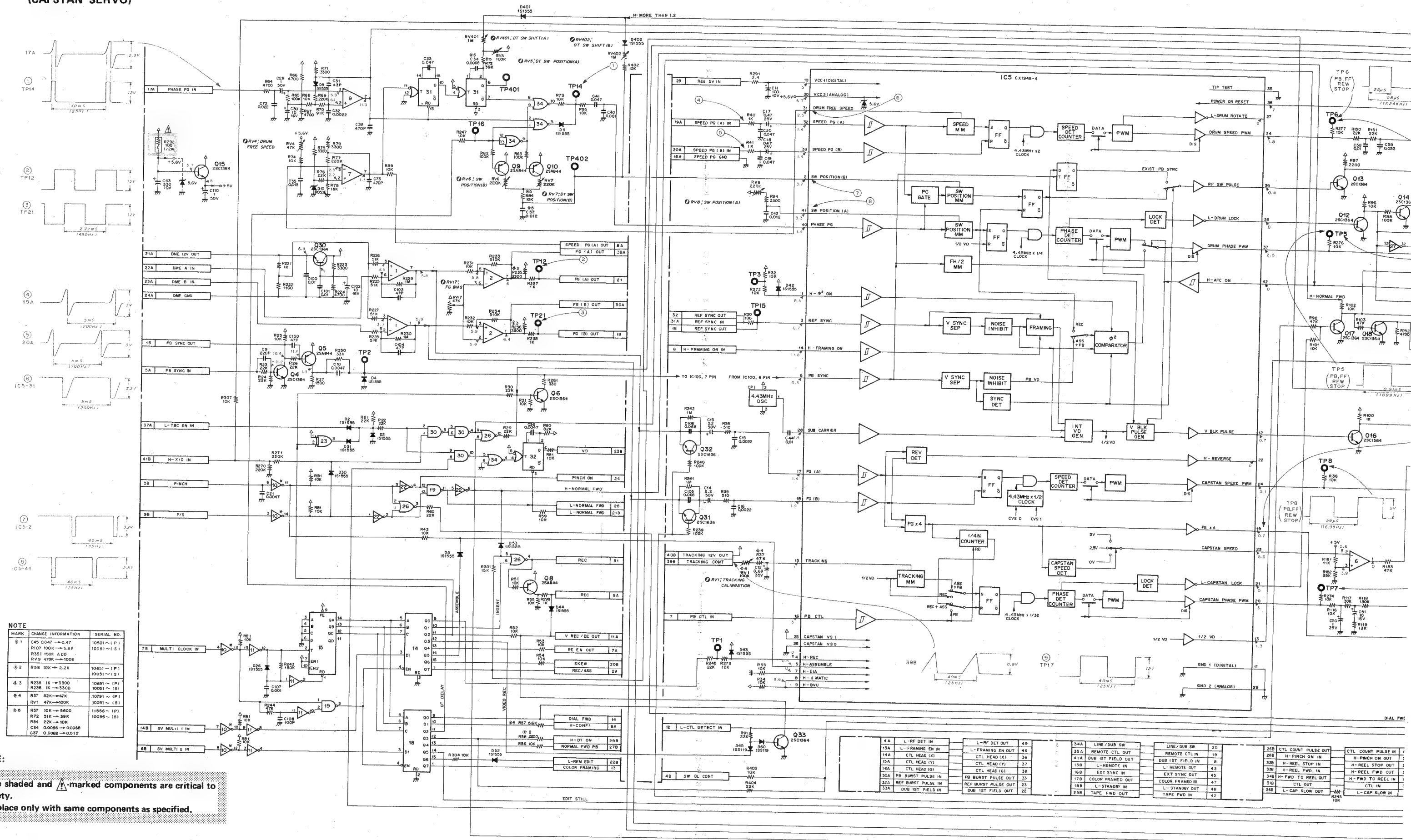
SERIAL NO.  
U/C: 124 ~  
J: 1063 ~  
P: 11691 ~  
S: 10116 ~  
PM: 10081 ~



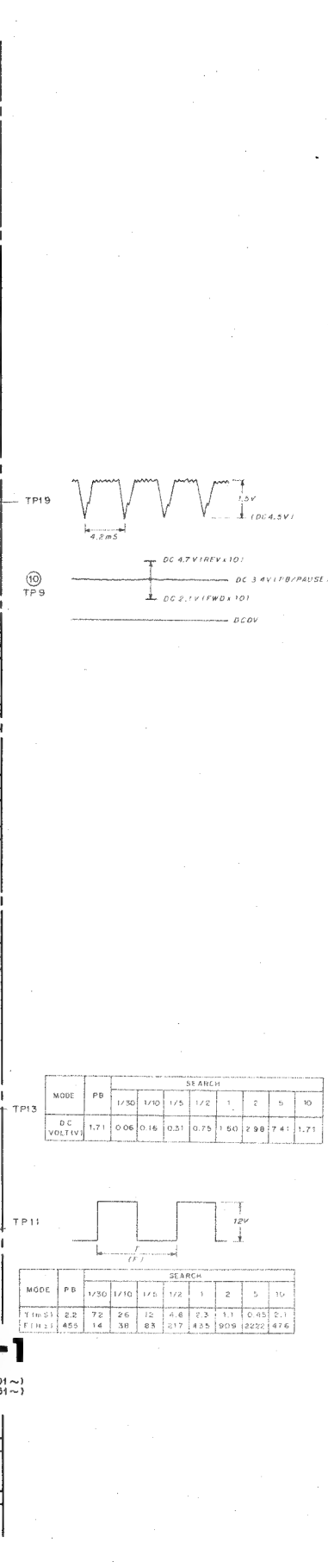
**AU-13**

1-604-337-16,17,18  
BVU-820 [S/N.10201~(U/C)]  
BVU-820P [S/N.10151~(J)]  
BVU-820S [S/N.10001~]  
BVU-820PM [S/N.10001~]



SV-52-1 (DRUM SERVO)  
(CAPSTAN SERVO)





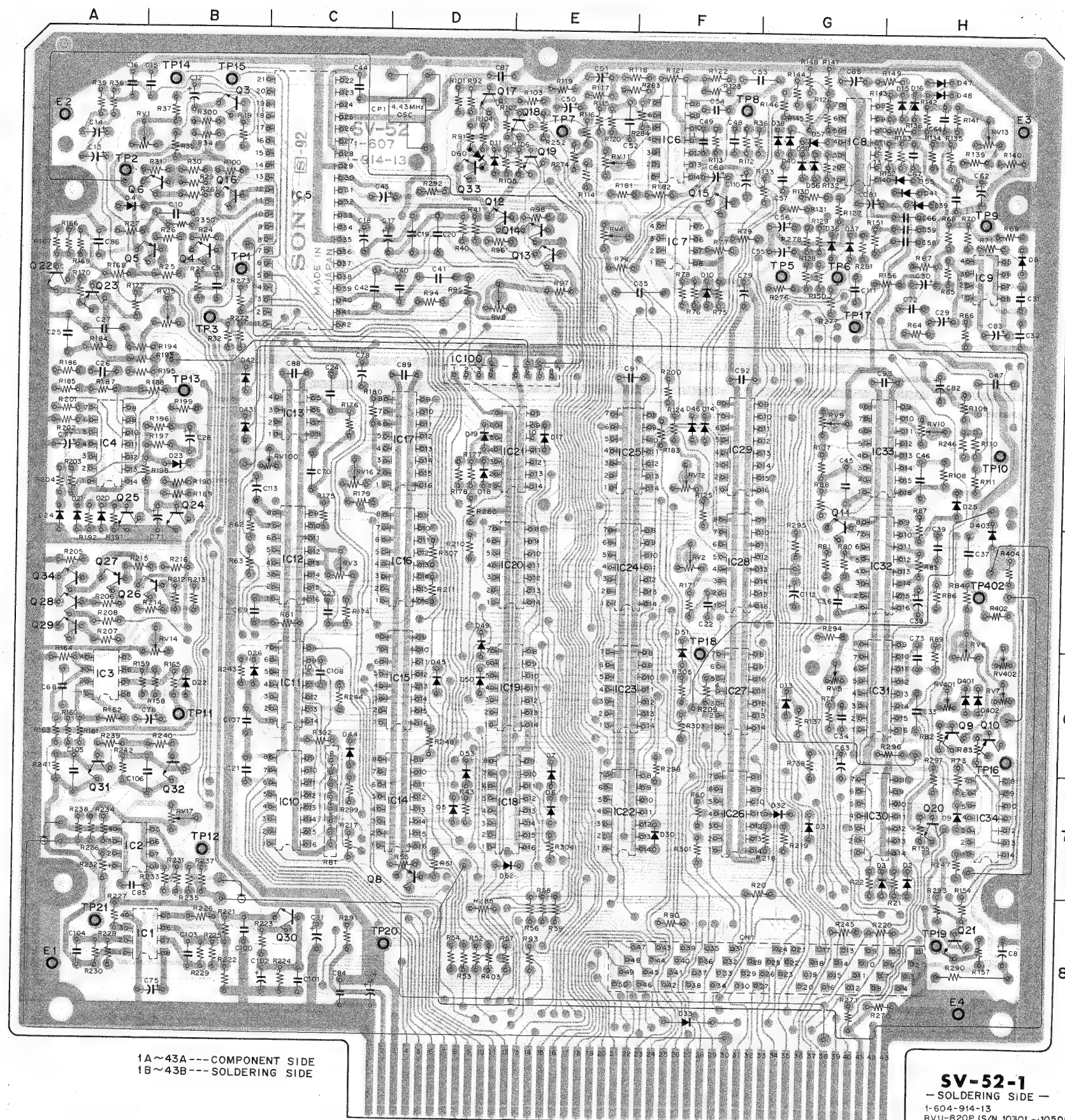
1-607-914-13,14  
BVU-820P (S/N. 10301~)  
BVU-820S (S/N. 10051~)



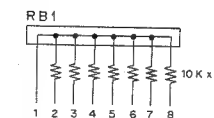
SV-52-1 (DRUM SERVO)  
(CAPSTAN SERVO)

Serial No. 10301 to 10500

REF NO.	TYPE	PIN NO.			
		+V(+12V)	+V(5V)	GND	-V(-12V)
IC 1	μPC4558C	8	4		
IC 2	NJM2903D	8	4		
IC 3	μPC4558C	8			4
IC 4	μPC324C	4			11
IC 5	CX194A	30	10	11, 29	
IC 6	μPC324C	4			11
IC 7	μPC311C	8			1, 4
IC 8	μPC324C	4			11
IC 9	μPC311C	8			1, 4
IC 10	M54517P	8			8
IC 11	TC4069UBP, CD4069UBE	14			7
IC 12	MC14538BCP	16			8
IC 13	μPC4558C	8			4
IC 14	TC4099BP, CD4099BE	16			8
IC 15	TC40161BP, CD40161BE	16			8
IC 16	TC4053BP, CD4053BE	16			8
IC 17	TC4052BP, CD4052BE	16			8
IC 18	TC4099BP, CD4099BE	16			8
IC 19	TC4011BP, CD4011BE	14			7
IC 20	TC4023BP, CD4023BE	14			7
IC 21	TC4001BP, CD4001BE	14			7
IC 22	TC4069UBP, CD4069UBE	14			7
IC 23	TC4030BP, CD4030BE	14			7
IC 24	TC4011BP, CD4011BE	14			7
IC 25	TC4013BP, CD4013BE	14			7
IC 26	TC4001BP, CD4001BE	14			7
IC 27	TC4069UBP, CD4069UBE	14			7
IC 28	MC14538BCP	16			8
IC 29	TC4053BP, CD4053BE	16			8
IC 30	TC4011BP, CD4011BE	14			7
IC 31	MC14538BCP	16			8
IC 32	MC14538BCP	16			8
IC 33	MC14538BCP	16			8
IC 34	TC4001BP, CD4001BE	14			7



CN1	G-8	IC1	B-8	RB1	C-7
CP1	D-1	IC2	A-7		
		IC3	A-6	RV1	A-1
		IC4	A-4	RV2	F-5
D2	H-7	IC5	C-2	RV3	C-5
D3	H-7	IC6	F-1	RV4	E-2
D4	A-2	IC7	F-2	RV5	G-6
D5	D-7	IC8	G-1	RV6	H-5
D6	E-7	IC9	H-2	RV7	H-6
D7	E-7	IC10	C-7	RV8	D-3
D8	H-2	IC11	C-6	RV9	G-4
D9	H-7	IC12	C-5	RV10	H-4
D10	F-3	IC13	C-4	RV11	E-2
D11	D-2	IC14	D-7	RV12	F-4
D12	G-6	IC15	D-6	RV13	H-1
D13	F-4	IC16	D-5	RV14	B-5
D14	H-1	IC17	D-4	RV15	B-3
D15	H-1	IC18	E-7	RV16	C-4
D16	E-4	IC19	E-6	RV17	B-7
D17	D-4	IC20	E-5	RV18	C-4
D18	D-4	IC21	E-4	RV19	C-4
D19	D-4	IC22	E-7	RV20	C-4
D20	A-4	IC23	E-6	RV21	H-6
D21	A-4	IC24	E-5		
D22	B-6	IC25	E-4	TP1	B-2
D23	B-4	IC26	F-7	TP2	A-2
D24	A-4	IC27	F-6	TP3	B-3
D25	H-6	IC28	F-5	TP4	G-2
D26	B-6	IC29	F-4	TP5	G-2
D27	F-7	IC30	H-7	TP6	F-1
D28	G-7	IC31	H-6	TP7	F-1
D29	F-8	IC32	H-5	TP8	H-2
D30	G-2	IC33	H-4	TP9	H-4
D31	G-2	IC34	H-7	TP10	H-4
D32	G-1	IC100	D-3	TP11	B-6
D33	H-2			TP12	B-3
D34	G-1			TP13	B-3
D35	H-2			TP14	B-1
D36	G-1			TP15	B-1
D37	H-2			TP16	H-6
D38	G-1			TP17	G-3
D39	H-2			TP18	F-6
D40	H-2			TP19	H-8
D41	B-3			TP20	D-8
D42	B-3			TP21	A-8
D43	B-3			TP22	A-8
D44	C-6			TP23	G-6
D45	D-6			TP24	H-5
D46	F-4				
D47	H-1				
D48	H-1				
D49	D-6				
D50	D-6				
D51	F-6				
D52	E-7				
D53	D-7				
D54	H-2				
D55	G-2				
D56	G-1				
D57	G-2				
D58	D-2				
D59	D-2				
D60	B-5				
D61	B-4				
D62	B-4				
D63	H-5				
E1	A-8				
E2	A-1				
E3	H-1				
E4	H-8				

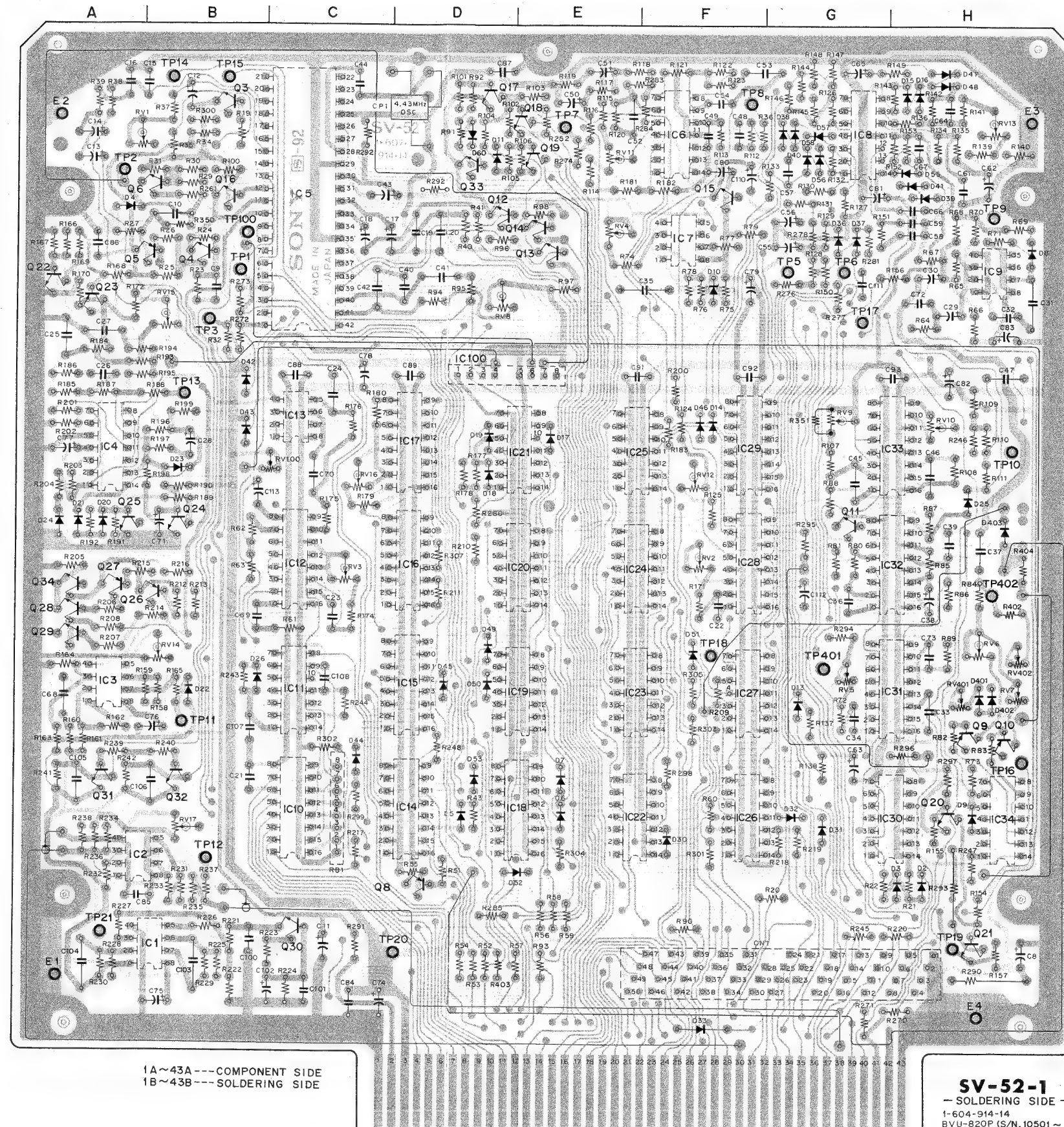




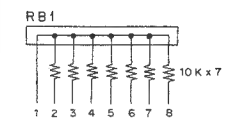
SV-52-1 (DRUM SERVO)  
(CAPSTAN SERVO)

Serial No. 10501 and higher

REF NO.	TYPE	PIN NO.			
		+V(+12V)	+V(5V)	GND	-V(-12V)
IC 1	μPC4558C	8		4	
IC 2	NJM2903D	8		4	
IC 3	μPC4558C	8		4	
IC 4	μPC324C	4			11
IC 5	CX194A	30	10	11, 29	
IC 6	μPC324C	4		11	
IC 7	μPC311C	8		1, 4	
IC 8	μPC324C	4		11	
IC 9	μPC311C	8		1, 4	
IC 10	M54517P			8	
IC 11	TC4069UBP, CD4069UBE	14		7	
IC 12	MC14538BCP	16		8	
IC 13	μPC4558C	8		4	
IC 14	TC4099BP, CD4099BE	16		8	
IC 15	TC40161BP, CD40161BE	16		8	
IC 16	TC4053BP, CD4053BE	16		8	
IC 17	TC4052BP, CD4052BE	16		8	
IC 18	TC4099BP, CD4099BE	16		8	
IC 19	TC4011BP, CD4011BE	14		7	
IC 20	TC4023BP, CD4023BE	14		7	
IC 21	TC4001BP, CD4001BE	14		7	
IC 22	TC4069UBP, CD4069UBE	14		7	
IC 23	TC4030BP, CD4030BE	14		7	
IC 24	TC4011BP, CD4011BE	14		7	
IC 25	TC4013BP, CD4013BE	14		7	
IC 26	TC4001BP, CD4001BE	14		7	
IC 27	TC4069UBP, CD4069UBE	14		7	
IC 28	MC14538BCP	16		8	
IC 29	TC4053BP, CD4053BE	16		8	
IC 30	TC4011BP, CD4011BE	14		7	
IC 31	MC14538BCP	16		8	
IC 32	MC14538BCP	16		8	
IC 33	MC14538BCP	16		8	
IC 34	TC4001BP, CD4001BE	14		7	

1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDESV-52-1  
— SOLDERING SIDE —  
1-604-914-14  
BVU-820P (S/N. 10501 ~ )  
BVU-820S (S/N. 10051 ~ )

CN1	G - 8	IC1	B - 8	RB1	C - 7
CP1	D - 1	IC2	A - 7		
		IC3	A - 6	RV1	A - 1
		IC4	A - 4	RV2	F - 5
D2	H - 7	IC5	C - 2	RV3	C - 5
D3	H - 7	IC6	F - 1	RV4	E - 2
D4	A - 2	IC7	F - 2	RV5	G - 6
D5	D - 7	IC8	G - 1	RV6	H - 5
D6	E - 7	IC9	H - 2	RV7	H - 6
D7	E - 7	IC10	C - 7	RV8	D - 3
D8	H - 2	IC11	C - 6	RV9	G - 4
D9	H - 7	IC12	C - 5	RV10	H - 4
D10	F - 3	IC13	C - 4	RV11	E - 2
D11	D - 2	IC14	D - 7	RV12	F - 4
D13	G - 6	IC15	D - 6	RV13	H - 1
D14	F - 4	IC16	D - 5	RV14	B - 5
D15	H - 1	IC17	D - 4	RV15	G - 3
D16	H - 1	IC18	E - 7	RV16	C - 4
D17	E - 4	IC19	E - 6	RV17	B - 7
D18	D - 4	IC20	E - 5	RV100C	- 4
D19	D - 4	IC21	E - 4	RV401H	- 6
D20	A - 4	IC22	E - 7	RV402H	- 6
D21	A - 4	IC23	E - 6		
D22	B - 6	IC24	E - 5	TP1	B - 2
D23	B - 4	IC25	E - 4	TP2	A - 2
D24	A - 4	IC26	F - 7	TP3	B - 3
D25	H - 4	IC27	F - 6	TP5	G - 2
D26	B - 6	IC28	F - 5	TP6	G - 2
D30	F - 7	IC29	F - 4	TP7	E - 1
D31	G - 7	IC30	H - 7	TP8	F - 1
D32	G - 7	IC31	H - 6	TP9	H - 2
D33	F - 8	IC32	H - 5	TP10	H - 4
D36	G - 2	IC33	H - 4	TP11	B - 6
D37	G - 2	IC34	H - 7	TP12	B - 7
D38	G - 1	IC100	D - 3	TP13	B - 3
D39	H - 2			TP14	B - 1
D40	G - 1	Q3	B - 1	TP15	B - 1
D41	H - 2	Q4	B - 2	TP16	H - 6
D42	B - 3	Q5	B - 2	TP17	G - 3
D43	B - 4	Q6	B - 2	TP18	F - 6
D44	C - 6	Q8	D - 7	TP19	H - 8
D45	D - 6	Q9	H - 6	TP20	D - 8
D46	F - 4	Q10	H - 6	TP21	A - 8
D47	H - 1	Q11	G - 5	TP100	B - 2
D48	H - 1	Q12	D - 2	TP401	G - 6
D49	D - 5	Q13	E - 2	TP402	H - 5
D50	D - 6	Q14	E - 2		
D51	F - 6	Q15	F - 2		
D52	E - 7	Q16	B - 2		
D53	D - 7	Q17	D - 1		
D55	H - 2	Q18	E - 1		
D56	G - 2	Q19	E - 2		
D57	G - 1	Q20	H - 7		
D58	G - 2	Q21	H - 8		
D60	D - 2	Q22	A - 3		
D401	B - 5	Q23	A - 3		
D402	B - 4	Q24	B - 4		
D403	H - 5	Q25	A - 4		
		Q26	B - 5		
		Q27	A - 5		
E1	A - 8	Q28	A - 5		
E2	A - 1	Q29	A - 5		
E3	H - 1	Q30	C - 8		
E4	H - 8	Q31	A - 7		
		Q32	B - 7		
		Q33	D - 2		
		Q34	A - 5		

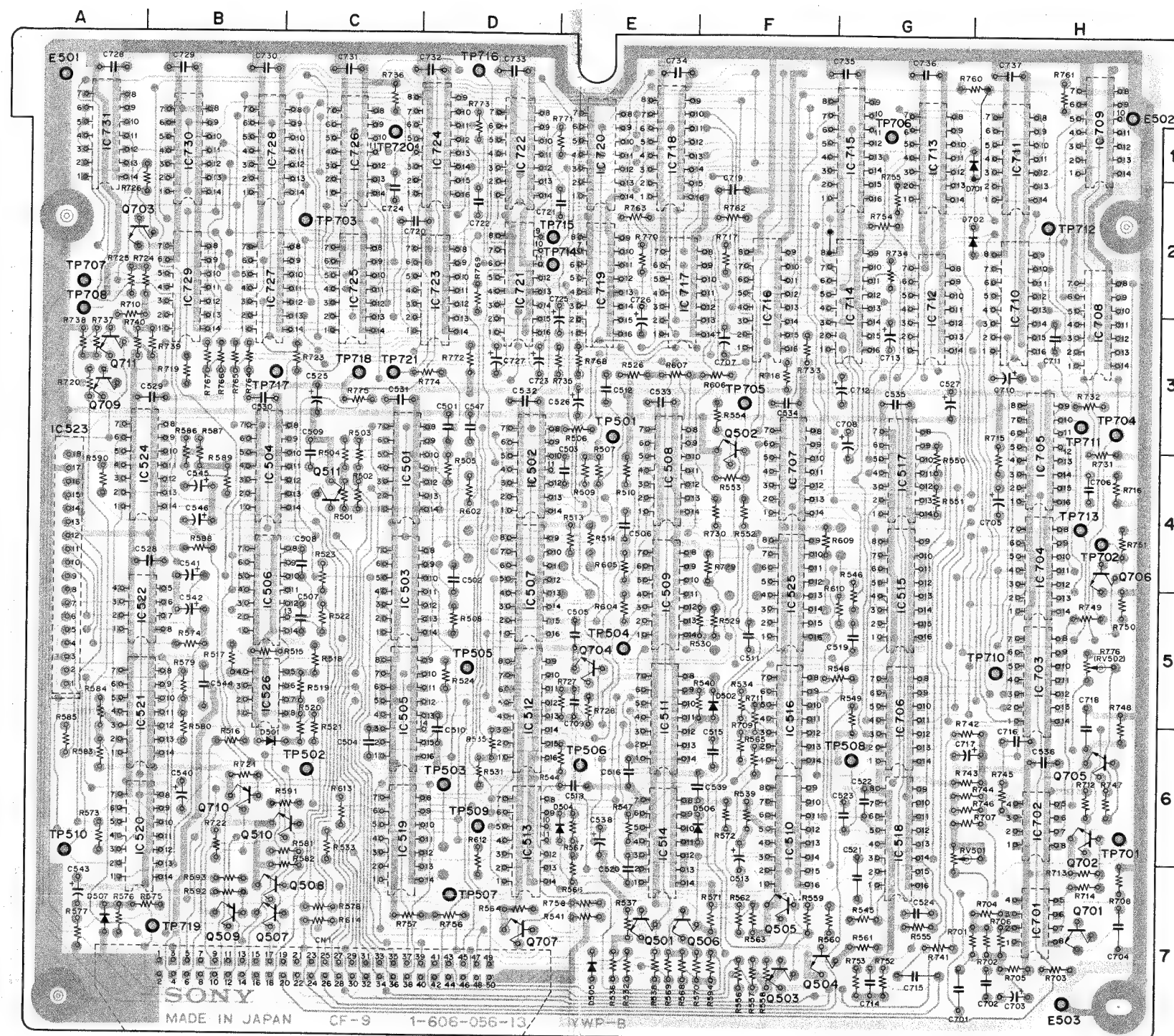








CF-9 (CTL REC PB AMPLIFIER)  
(COLOR FRAMING CONTROL)

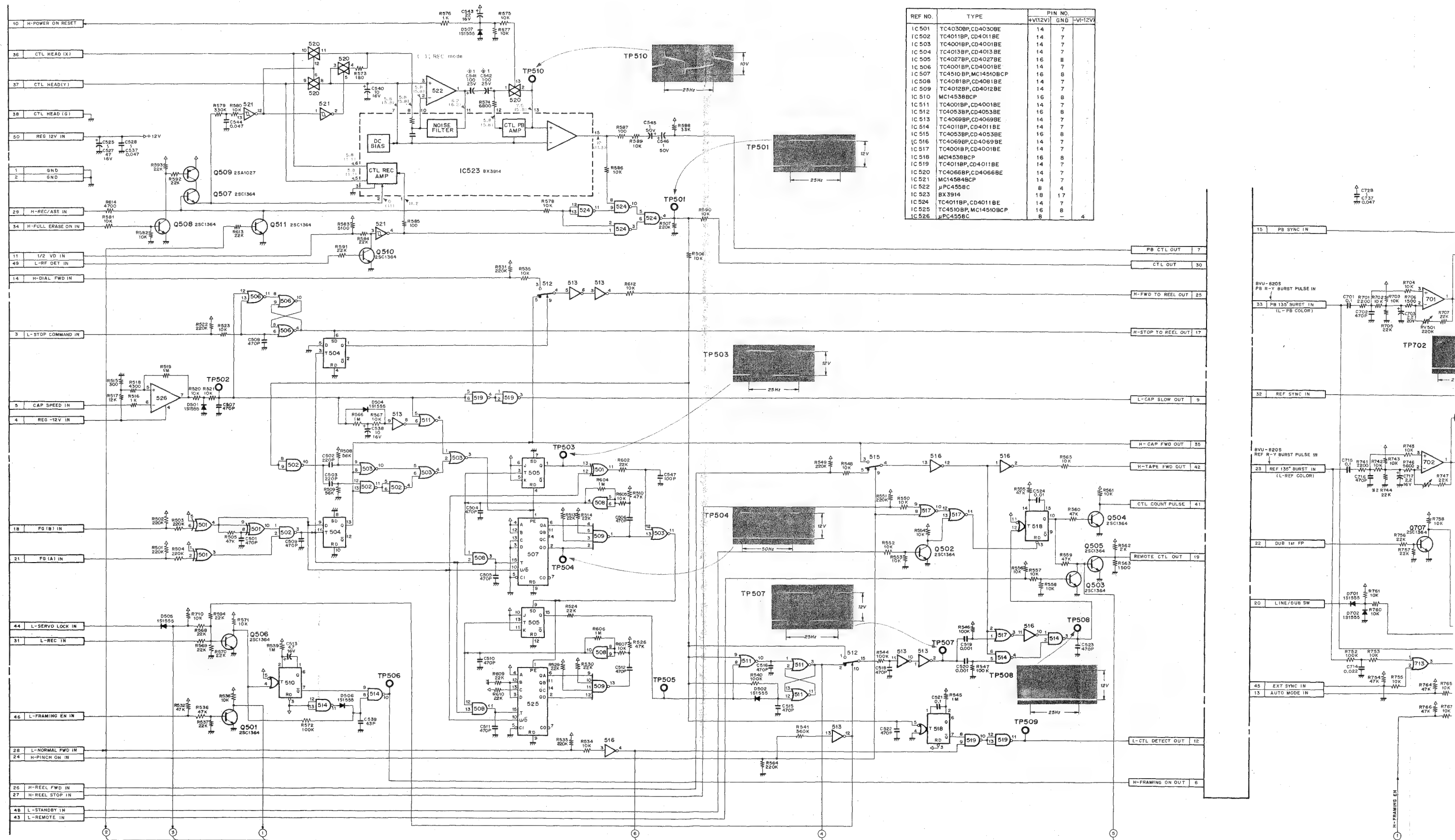


CN1	C-7	Q701	H-7
D501	B-6	Q702	H-6
D502	F-5	Q703	A-2
D504	E-6	Q704	E-5
D505	E-7	Q705	H-6
D506	F-6	Q706	H-4
D507	A-7	Q707	D-7
D701	H-1	Q709	A-3
D702	G-2	Q710	B-6
		Q711	A-3
E501	A-1	RV501	G-6
E502	H-1	RV502	H-5
E503	H-7	(R776)	
IC501	C-4	TP501	E-3
IC502	D-4	TP502	C-6
IC503	C-5	TP503	D-6
IC504	B-4	TP504	E-5
IC505	C-5	TP505	D-5
IC506	B-5	TP506	E-6
IC507	D-5	TP507	D-7
IC508	E-4	TP508	G-6
IC509	E-5	TP509	D-6
IC510	F-6	TP510	A-6
IC511	E-5	TP701	H-6
IC512	D-5	TP702	H-4
IC513	D-6	TP703	C-2
IC514	E-6	TP704	H-3
IC515	G-5	TP705	F-3
IC516	F-5	TP706	G-1
IC517	G-4	TP707	A-2
IC518	G-6	TP708	A-3
IC519	C-6	TP710	H-5
IC520	A-6	TP711	H-3
IC521	A-5	TP712	H-2
IC522	A-5	TP713	H-4
IC523	A-4	TP714	D-2
IC524	A-4	TP715	D-2
IC525	F-4	TP716	D-1
IC526	B-5	TP717	B-3
IC701	H-7	TP718	C-3
IC702	H-6	TP719	B-7
IC703	H-5	TP720	C-1
IC704	H-4	TP721	C-3
IC705	H-4		
IC706	G-5		
IC707	F-4		
IC708	H-2		
IC709	H-1		
IC710	H-2		
IC711	H-1		
IC712	G-2		
IC713	G-1		
IC714	G-2		
IC715	G-1		
IC716	F-2		
IC717	E-2		
IC718	E-1		
IC719	E-2		
IC720	E-1		
IC721	D-2		
IC722	D-1		
IC723	D-2		
IC724	D-1		
IC725	C-2		
IC726	C-1		
IC727	B-2		
IC728	B-1		
IC729	B-2		
IC730	B-1		
IC731	A-1		
Q501	E-7		
Q502	F-4		
Q503	F-7		
Q504	F-7		
Q505	F-7		
Q506	E-7		
Q507	B-7		
Q508	B-7		
Q509	B-7		
Q510	C-6		
Q511	C-4		

CF-9 -SOLDERING SIDE-  
1-606-056-13,14  
BVU-820P (S/N.10001~)  
BVU-820S (S/N.10001~)



CF-9 (CTL REC PB AMPLIFIER)  
(COLOR FRAMING CONTROL)





## NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
1	R714 22K → 47K R749 22/16V → 100/25V C541 C542	P: 10251~ S: 10051~
2	RV502 220K → R776 220K R744 22K OR 82K 22K	P: 10601~ S: 10051~ P: 10601~ S: 10051~ P: 10651~ S: 10051~

PB SYNC (IC516-6)

3/4H MMV (TP711)

V SYNC (IC704-13)

1/2V MMV (IC716-6)

1/3V MMV (IC705-6)

INITIALIZING PULSE (TP710)

T-FF (IC704-1)

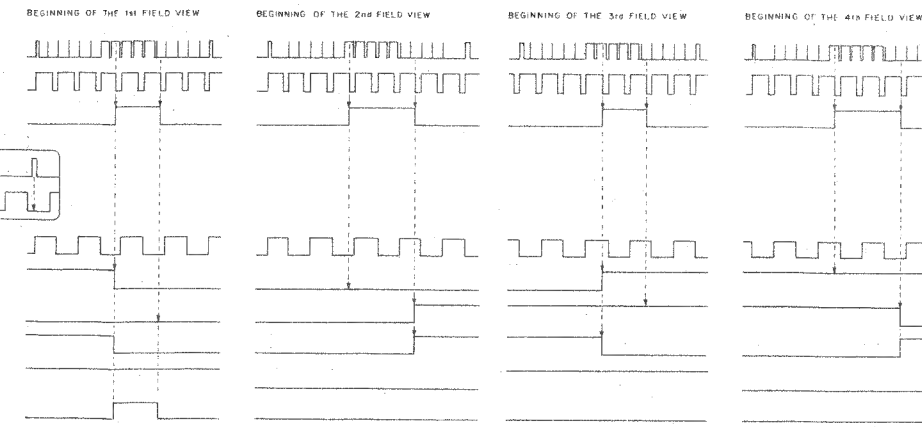
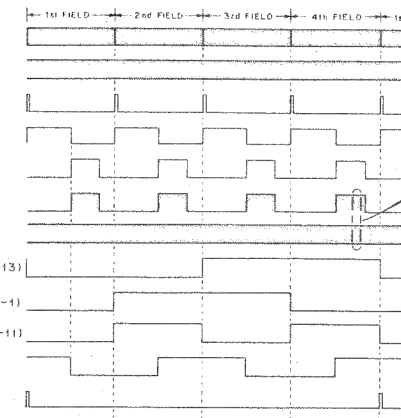
3rd+4th FIELD PULSE (IC706-13)

2nd+3rd FIELD PULSE (IC706-1)

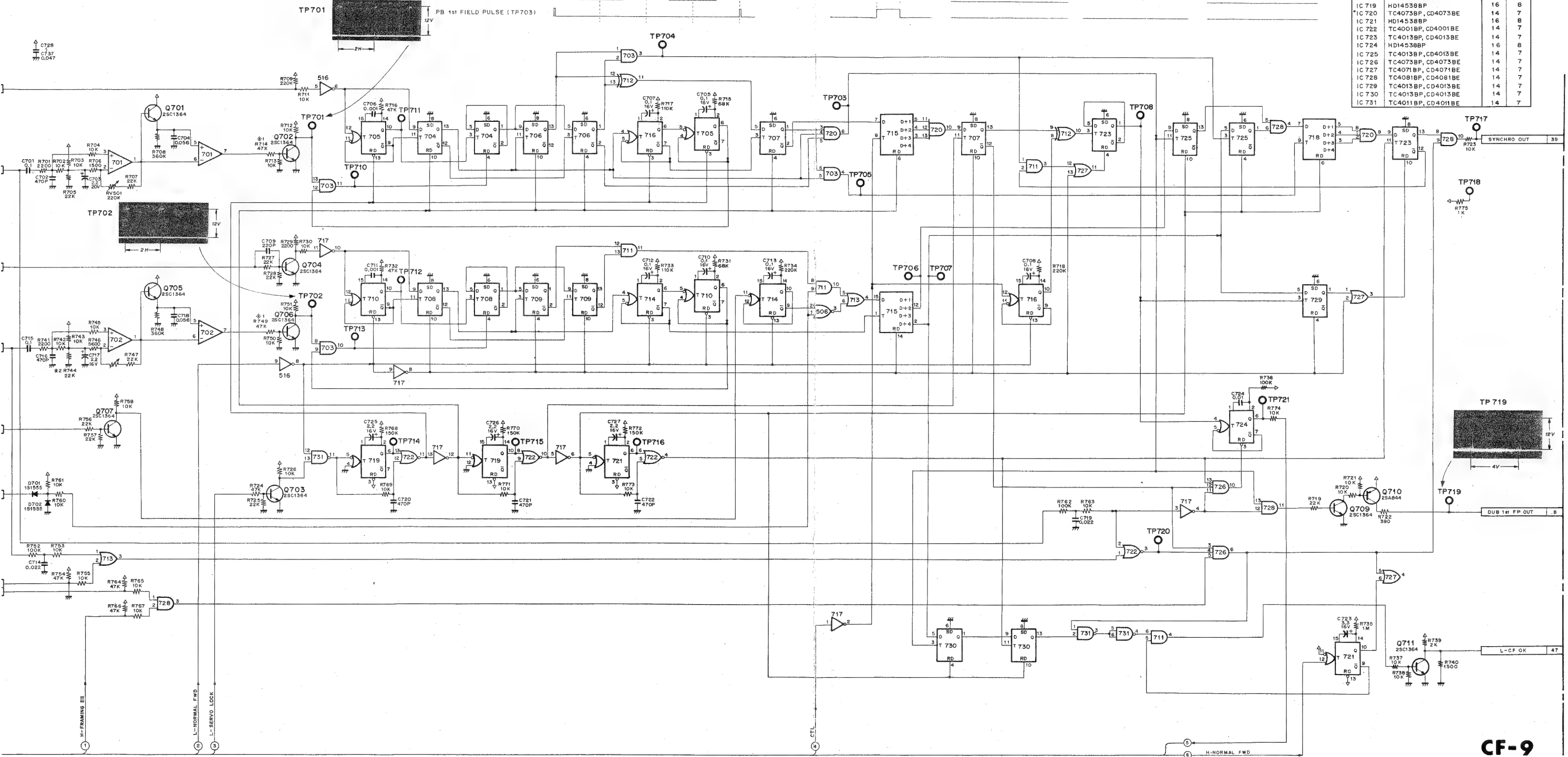
2nd+4th FIELD PULSE (IC712-11)

D-FF (IC707-1)

PB 1st FIELD PULSE (TP703)



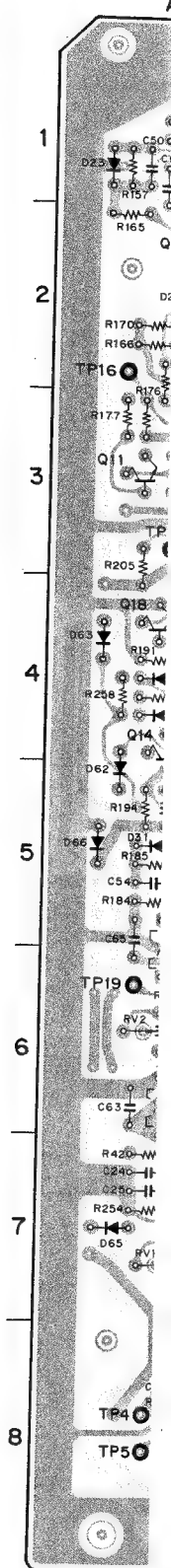
REF. NO.	TYPE	PIN NO.	GND
IC 701	TL082CP	8	4
IC 702	TL082CP	8	4
IC 703	TC4018BP, CD4018BE	14	7
IC 704	TC4013BP, CD4013BE	14	7
IC 705	HD14538BP	16	8
IC 706	TC4013BP, CD4013BE	14	7
IC 707	TC4013BP, CD4013BE	14	7
IC 708	TC4013BP, CD4013BE	14	7
IC 709	TC4013BP, CD4013BE	14	7
IC 710	HD14538BP	14	7
IC 711	TC4018BP, CD4018BE	14	7
IC 712	TC4030BP, CD4030BE	14	7
IC 713	TC4071BP, CD4071BE	14	7
IC 714	HD14538BP	16	8
IC 715	TC4015BP, CD4015BE	16	8
IC 716	HD14538BP	16	8
IC 717	TC4069BP, CD4069BE	14	7
IC 718	TC4015BP, CD4015BE	16	8
IC 719	HD14538BP	16	8
IC 720	TC4073BP, CD4073BE	14	7
IC 721	HD14538BP	16	8
IC 722	TC4001BP, CD4001BE	14	7
IC 723	TC4013BP, CD4013BE	14	7
IC 724	HD14538BP	16	8
IC 725	TC4013BP, CD4013BE	14	7
IC 726	TC4073BP, CD4073BE	14	7
IC 727	TC4071BP, CD4071BE	14	7
IC 728	TC4081BP, CD4081BE	14	7
IC 729	TC4013BP, CD4013BE	14	7
IC 730	TC4013BP, CD4013BE	14	7
IC 731	TC4011BP, CD4011BE	14	7





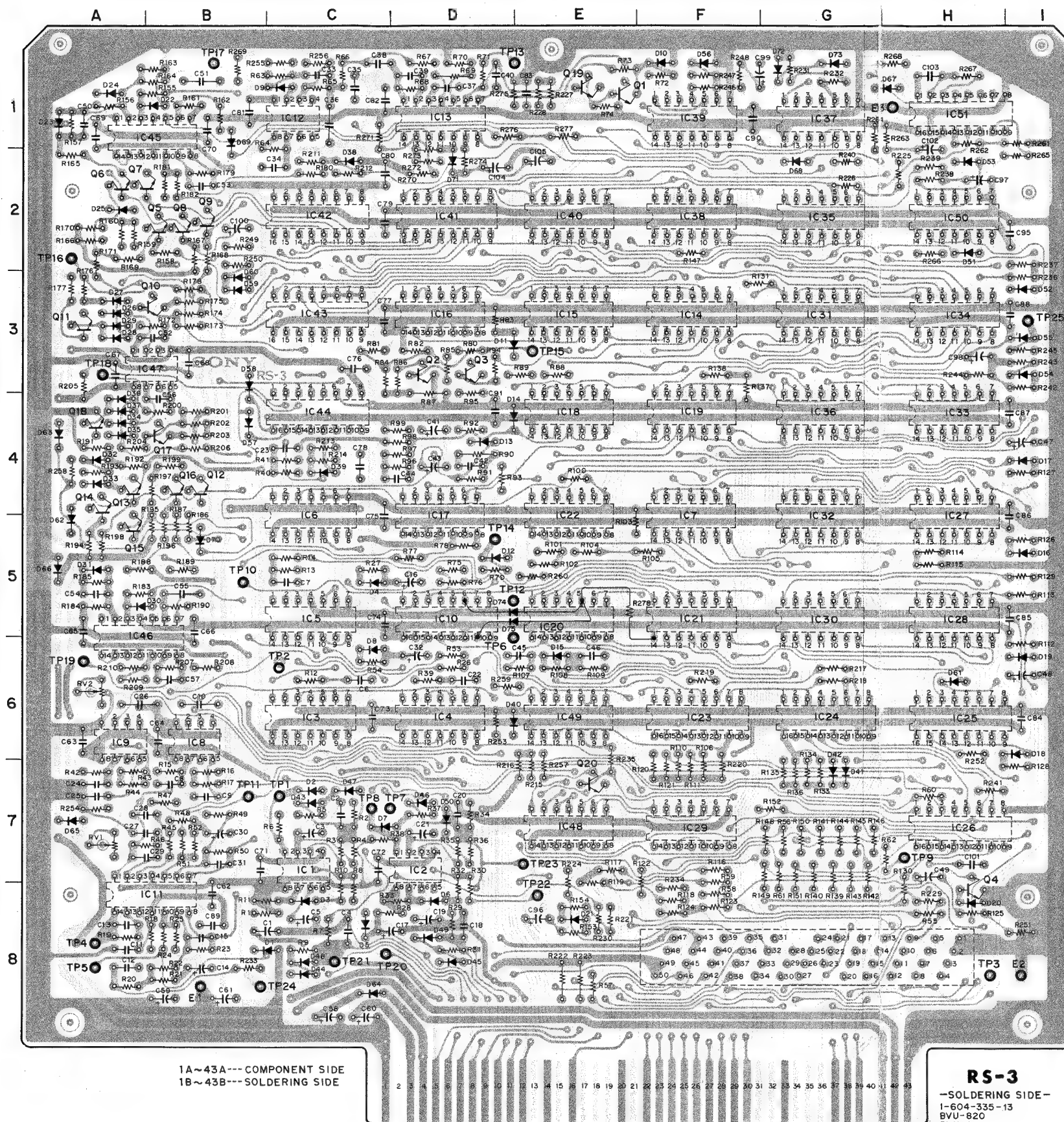
RS-3-1, 2

**RS-3-1,**





RS-3-1, 2 (REEL SERVO)

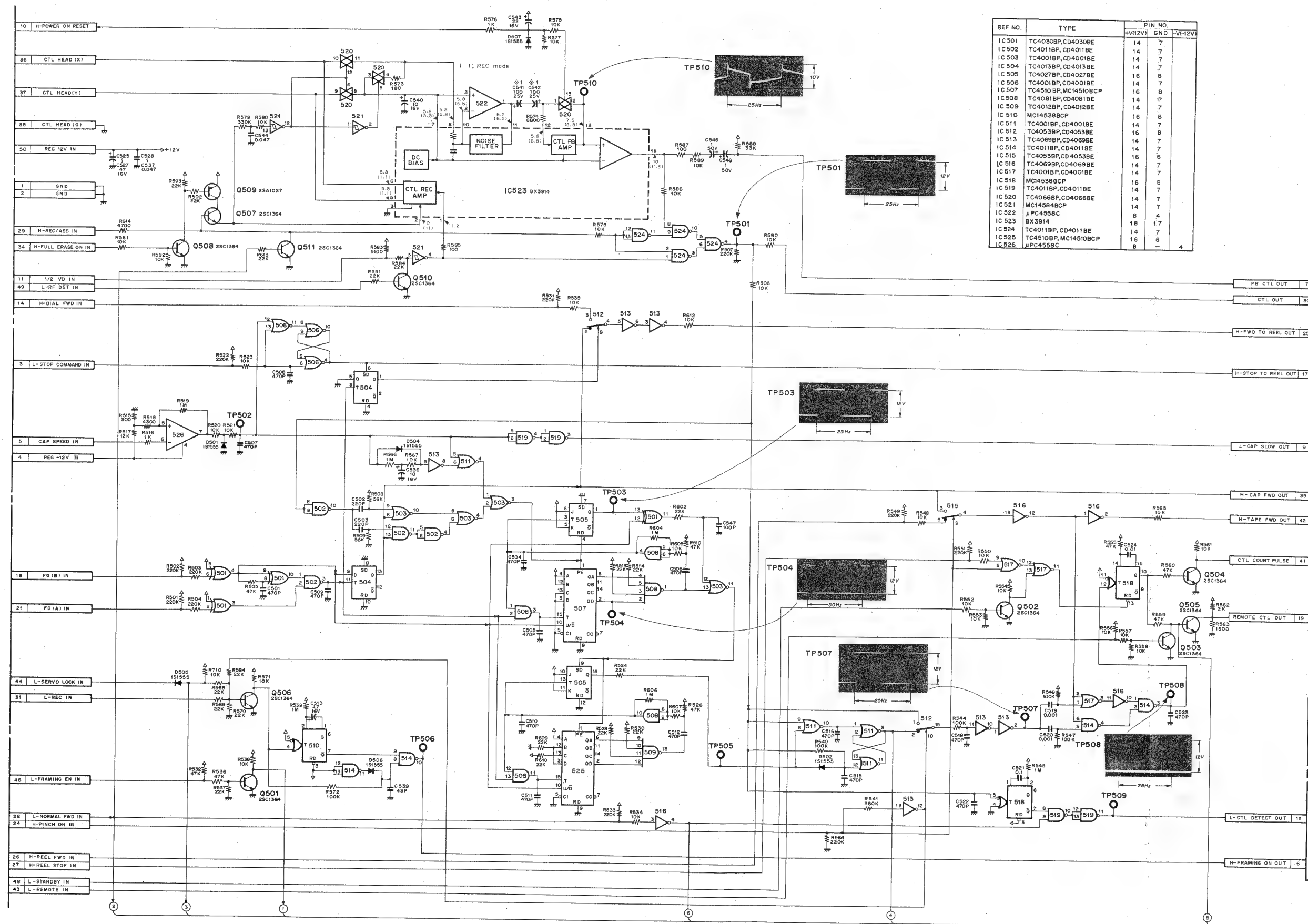


D1	C-8	IC1	C-7	RV1	A-7
D2	C-7	IC2	D-7	RV2	A-8
D3	C-8	IC3	C-8		
D4	C-5	IC4	D-6	TP1	C-7
D5	C-8	IC5	C-5	TP2	C-6
D6	D-8	IC6	C-5	TP3	H-8
D7	C-7	IC7	F-5	TP4	A-8
D8	C-6	IC8	B-6	TP5	A-8
D9	C-1	IC9	A-6	TP6	E-6
D10	F-1	IC10	D-5	TP7	D-7
D11	D-3	IC11	B-8	TP8	C-7
D12	D-5	IC12	C-1	TP9	H-7
D13	D-4	IC13	D-1	TP10	B-5
D14	E-4	IC14	F-3	TP11	B-7
D15	E-6	IC15	E-3	TP12	E-5
D16	I-5	IC16	D-3	TP13	E-1
D17	I-4	IC17	D-5	TP14	D-5
D18	I-6	IC18	E-4	TP15	E-3
D19	I-6	IC19	F-4	TP16	A-2
D20	H-8	IC20	E-5	TP17	B-1
D21	E-8	IC21	F-5	TP18	A-3
D22	B-1	IC22	E-5	TP19	A-6
D23	A-1	IC23	F-6	TP20	C-8
D24	A-1	IC24	G-6	TP21	C-8
D25	A-2	IC25	H-6	TP22	E-8
D26	A-3	IC26	H-7	TP23	E-7
D27	A-3	IC27	H-5	TP24	B-8
D28	A-3	IC28	H-5	TP25	I-3
D29	A-3	IC29	F-7		
D30	A-5	IC30	G-5		
D31	A-5	IC31	G-3		
D32	A-4	IC32	G-5		
D33	A-4	IC33	H-4		
D34	A-4	IC34	H-3		
D35	A-4	IC35	G-2		
D36	A-4	IC36	G-4		
D37	A-4	IC37	G-1		
D38	C-2	IC38	F-2		
D39	C-4	IC39	F-1		
D40	E-6	IC40	E-2		
D41	G-7	IC41	D-2		
D42	G-7	IC42	C-2		
D43	C-7	IC43	C-3		
D44	C-8	IC44	C-4		
D45	D-8	IC45	B-1		
D46	D-7	IC46	A-6		
D47	C-7	IC47	B-3		
D48	C-8	IC48	E-7		
D49	D-8	IC49	E-6		
D50	D-7	IC50	H-2		
D51	H-2				
D52	I-3	Q1	E-1		
D53	H-2	Q2	D-3		
D54	I-3	Q3	D-3		
D55	I-3	Q4	H-8		
D56	F-1	Q5	B-2		
D57	B-4	Q6	A-2		
D58	B-3	Q7	A-2		
D59	B-3	Q8	B-2		
D60	B-3	Q9	B-2		
D61	H-6	Q10	B-3		
D62	A-5	Q11	A-3		
D63	A-4	Q12	B-4		
D64	C-8	Q13	A-4		
D65	A-7	Q14	A-4		
D66	A-5	Q15	A-5		
D67	H-1	Q16	B-4		
D68	G-2	Q17	B-4		
D69	B-1	Q18	A-4		
D70	B-5	Q19	E-1		
D71	D-2	Q20	E-7		
D72	G-1				
D73	G-1				
D74	D-5				
D75	D-5				
E1	B-8				
E2	I-8				
E3	H-1				

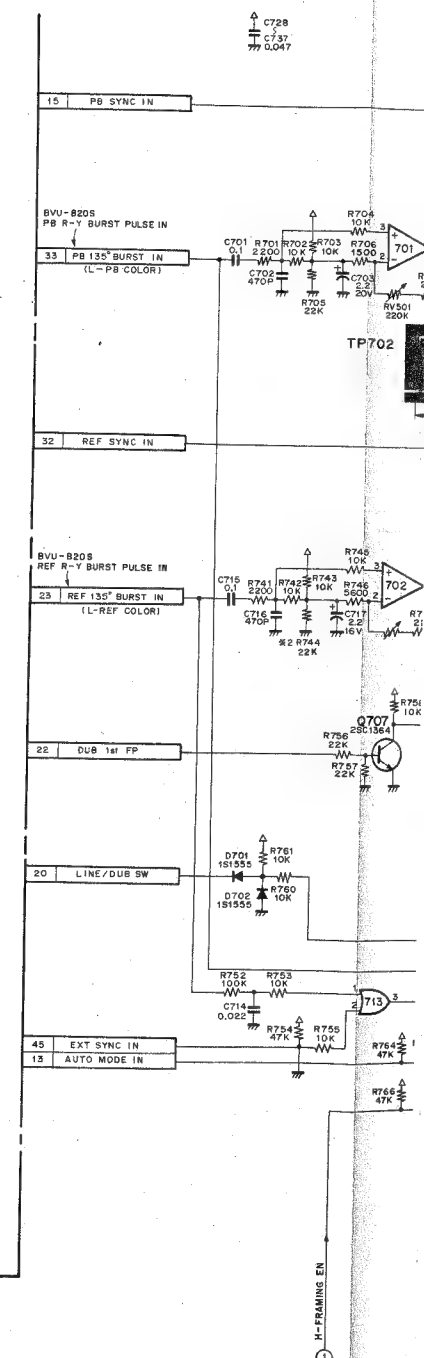
PFF.NO.	TYPE	PIN NO.			
		+V(+3.5V)+V(+12V)	GND	-V(-12V)	-V(-18V)
IC 1	NJM2903D	8	4		
2	NJM2903D	8	4		
3	TC4030BP,CD4030BE	14	7		
4	TC4030BP,CD4030BE	14	7		
5	TC4030BP,CD4030BE	14	7		
6	TC4030BP,CD4030BE	14	7		
7	TC4011BP,CD4011BE	14	7		
8	NE555N,M51841P	8	1		
9	NE555N,M51841P	8	1		
10	MC14538BCRHD14538BP	16	8		
11	μPC324C,LM324	4		11	
12	NE555N,M51841P	8	1		
13	μPC324C,LM324	4		11	
14	TC4001BP,CD4001BE	14	7		
15	TC4011BP,CD4011BE	14	7		
16	TC4066BP,CD4066BE	14	7		
17	μPC324C,LM324	4		11	
18	TC4066BP,CD4066BE	14	7		
19	TC4069BP,CD4069BE	14	7		
20	TC4069BP,CD4069BE	14	7		
21	TC4011BP,CD4011BE	14	7		
22	TC4066BP,CD4066BE	14	7		
23	M54517P	8			
24	TC4011BP,CD4011BE	16	8		
25	TC4099BP,CD4099BE	16	8		
26	TC4099BP,CD4099BE	16	8		
27	TC4001BP,CD4001BE	14	7		
28	TC4069BP,CD4069BE	14	7		
29	TC4001BP,CD4001BE	14	7		
30	TC4001BP,CD4001BE	14	7		
31	TC4001BP,CD4001BE	14	7		
32	TC4011BP,CD4011BE	14	7		
33	TC4001BP,CD4001BE	14	7		
34	TC4001BP,CD4001BE	14	7		
35	TC4069BP,CD4069BE	14	7		
36	TC4011BP,CD4011BE	14	7		
37	TC4001BP,CD4001BE	14	7		
38	TC4011BP,CD4011BE	14	7		
39	TC4001BP,CD4001BE	14	7		
40	TC4001BP,CD4001BE	14	7		
41	TC5067BP	16	8		
42	M54519P			8	
43	TC5067BP	16	8		
44	M54519P				8
45	μPC324C,LM324	4		11	
46	μPC324C,LM324	4		11	
47	μPC4558C,RC4558				4
48	TC4001BP,CD4001BE	14	7		
49	TC4011BP,CD4011BE	14	7		
50	TC4001BP,CD4001BE	14	7		
51	MC14538BCP	16	8		



CF-9 (CTL REC PB AMPLIFIER)  
(COLOR FRAMING CONTROL)



REF NO.	TYPE	PIN NO.	4
IC 501	TC4030BP, CD4030BE	14	7
IC 502	TC4011BP, CD4011BE	14	7
IC 503	TC4001BP, CD4001BE	14	7
IC 504	TC4013BP, CD4013BE	14	7
IC 505	TC4027BP, CD4027BE	16	8
IC 506	TC4001BP, CD4001BE	14	7
IC 507	TC4510BP, MC14510BCP	16	8
IC 508	TC4081BP, CD4081BE	14	7
IC 509	TC4012BP, CD4012BE	14	7
IC 510	MC14538BCP	16	8
IC 511	TC4001BP, CD4001BE	14	7
IC 512	TC4053BP, CD4053BE	14	7
IC 513	TC4069BP, CD4069BE	14	7
IC 514	TC4011BP, CD4011BE	14	7
IC 515	TC4053BP, CD4053BE	16	8
IC 516	TC4069BP, CD4069BE	14	7
IC 517	TC4001BP, CD4001BE	14	7
IC 518	MC14538BCP	16	8
IC 519	TC4011BP, CD4011BE	14	7
IC 520	TC4068BP, CD4068BE	14	7
IC 521	MC14584BCP	14	7
IC 522	JPC4558C	8	4
IC 523	8X3914	18	7
IC 524	TC4011BP, CD4011BE	14	7
IC 525	TC4510BP, MC14510BCP	16	8
IC 526	JPC4558C	8	4





NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
1	R714 22K → 47K R749 22/16V → 100/25V C342	P: 10251 ~ S: 10051 ~
2	RV502 220K → R776 220K R744 22K DR 82K 22K	P: 10601 ~ S: 10051 ~ P: 10601 ~ S: 10650 P: 10651 ~ S: 10051 ~

PB SYNC (IC516-6)

3/4H MMV (TP711)

V SYNC (IC704-13)

1/2V MMV (IC716-6)

1/3V MMV (IC705-6)

INITIALIZING PULSE (TP710)

T-FF (IC704-1)

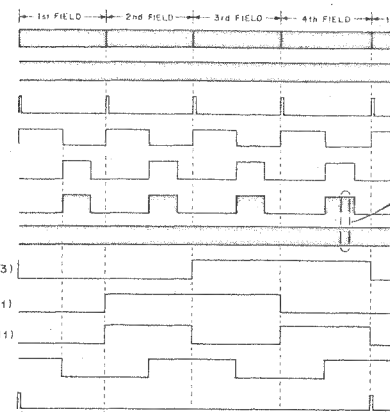
3rd+4th FIELD PULSE (IC706-13)

2nd+3rd FIELD PULSE (IC706-1)

2nd+4th FIELD PULSE (IC712-11)

D-FF (IC707-1)

PB 1st FIELD PULSE (TP703)



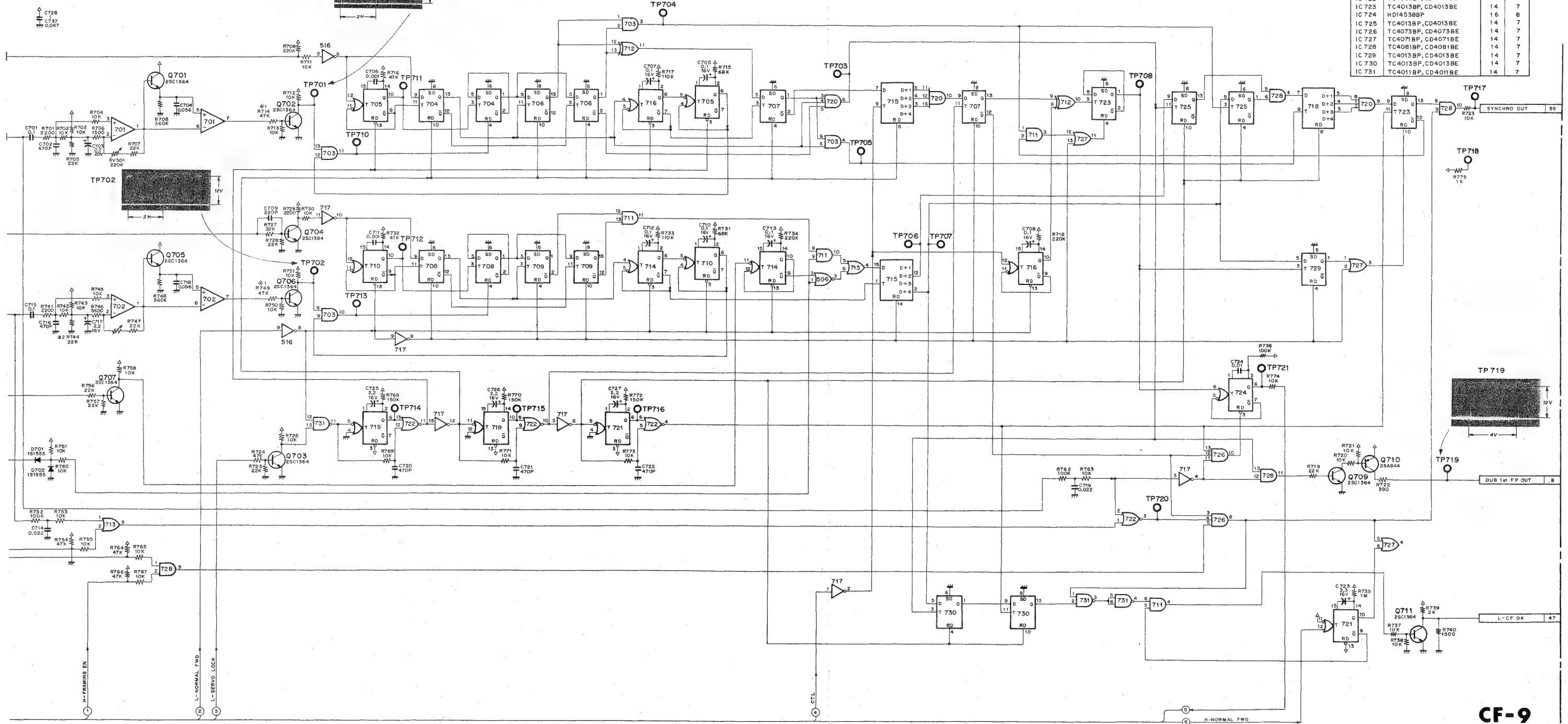
BEGINNING OF THE 1st FIELD VIEW

BEGINNING OF THE 2nd FIELD VIEW

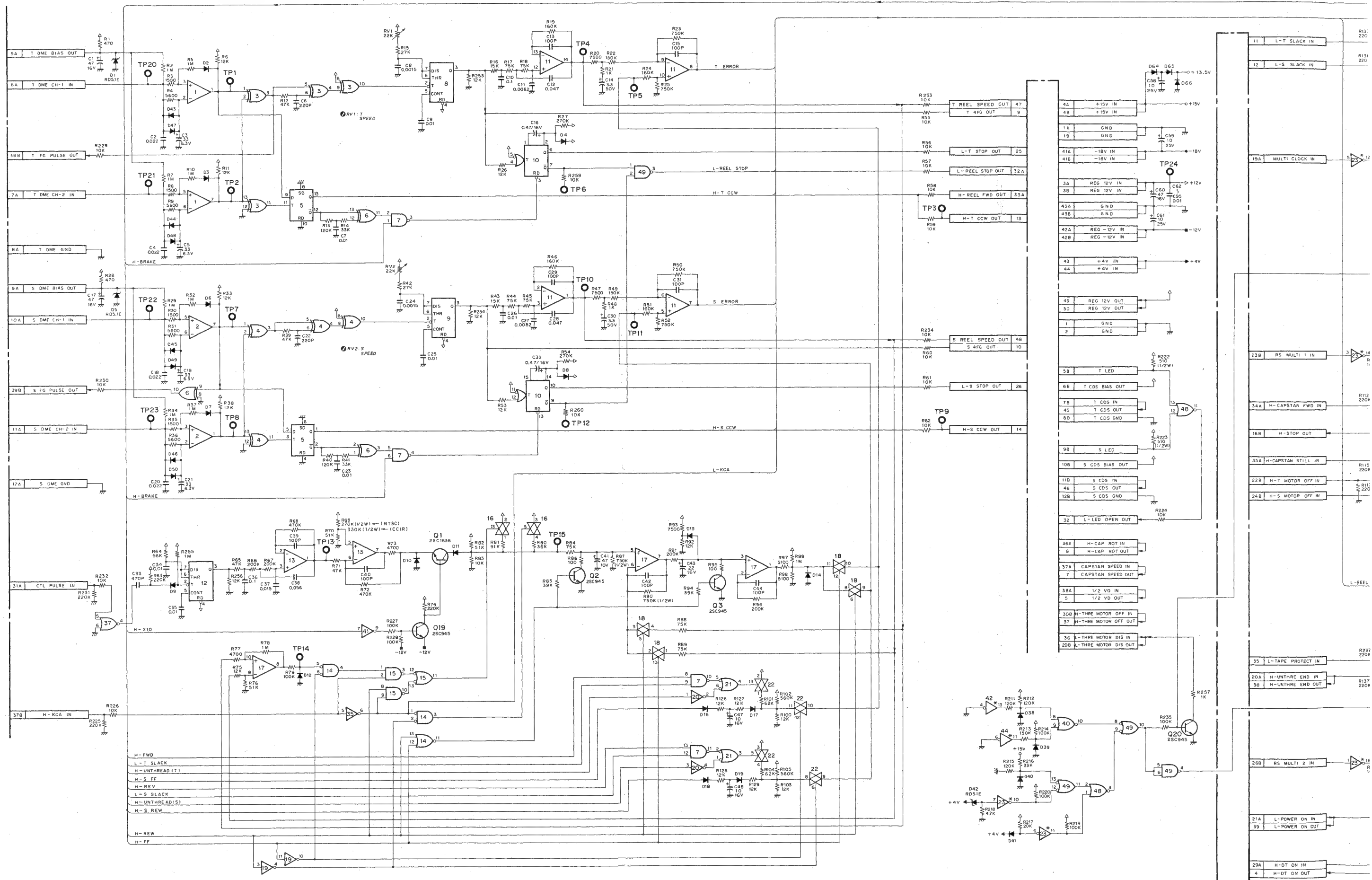
BEGINNING OF THE 3rd FIELD VIEW

BEGINNING OF THE 4th FIELD VIEW

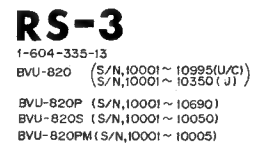
REF. NO.	TYPE	PIN NO.
IC 701	TL082CP	8 4
IC 702	TL082CP	8 4
IC 703	TC4013BP, CD4013BE	14 7
IC 704	TC4013BP, CD4013BE	14 7
IC 705	HD14538BP	16 8
IC 706	TC4013BP, CD4013BE	14 7
IC 707	TC4013BP, CD4013BE	14 7
IC 708	TC4013BP, CD4013BE	14 7
IC 709	TC4013BP, CD4013BE	14 7
IC 710	HD14538BP	16 8
IC 711	TC4013BP, CD4013BE	14 7
IC 712	TC4013BP, CD4013BE	14 7
IC 713	TC4013BP, CD4013BE	14 7
IC 714	HD14538BP	16 8
IC 715	TC4013BP, CD4013BE	14 7
IC 716	HD14538BP	16 8
IC 717	TC4013BP, CD4013BE	14 7
IC 718	TC4013BP, CD4013BE	14 7
IC 719	HD14538BP	16 8
IC 720	TC4013BP, CD4013BE	14 7
IC 721	HD14538BP	16 8
IC 722	TC4013BP, CD4013BE	14 7
IC 723	TC4013BP, CD4013BE	14 7
IC 724	HD14538BP	16 8
IC 725	TC4013BP, CD4013BE	14 7
IC 726	TC4013BP, CD4013BE	14 7
IC 727	TC4013BP, CD4013BE	14 7
IC 728	TC4013BP, CD4013BE	14 7
IC 729	TC4013BP, CD4013BE	14 7
IC 730	TC4013BP, CD4013BE	14 7
IC 731	TC4013BP, CD4013BE	14 7





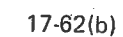




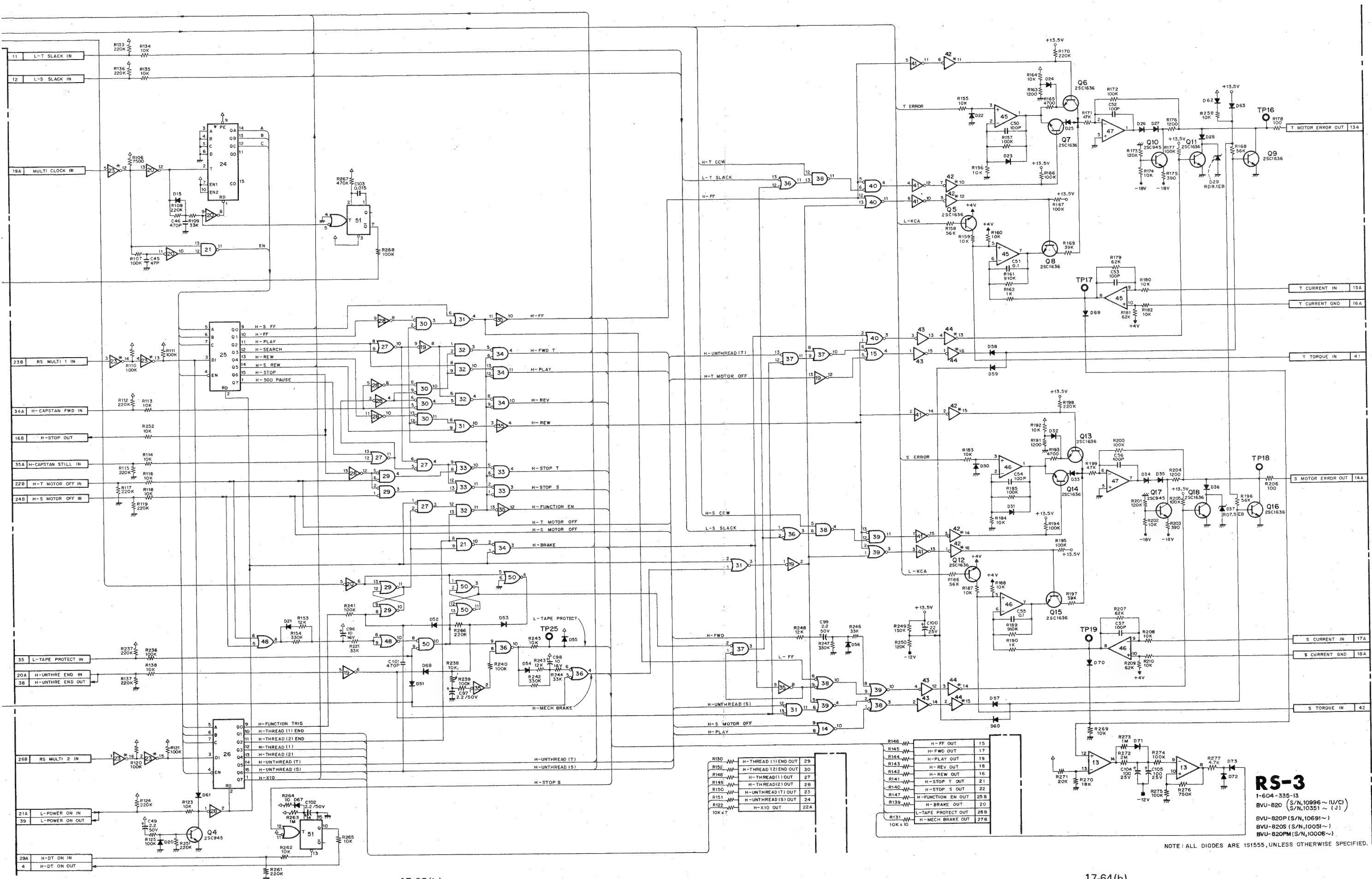


NOTE: ALL DIODES ARE 1S1555, UNLESS OTHERWISE SPECIFIED.











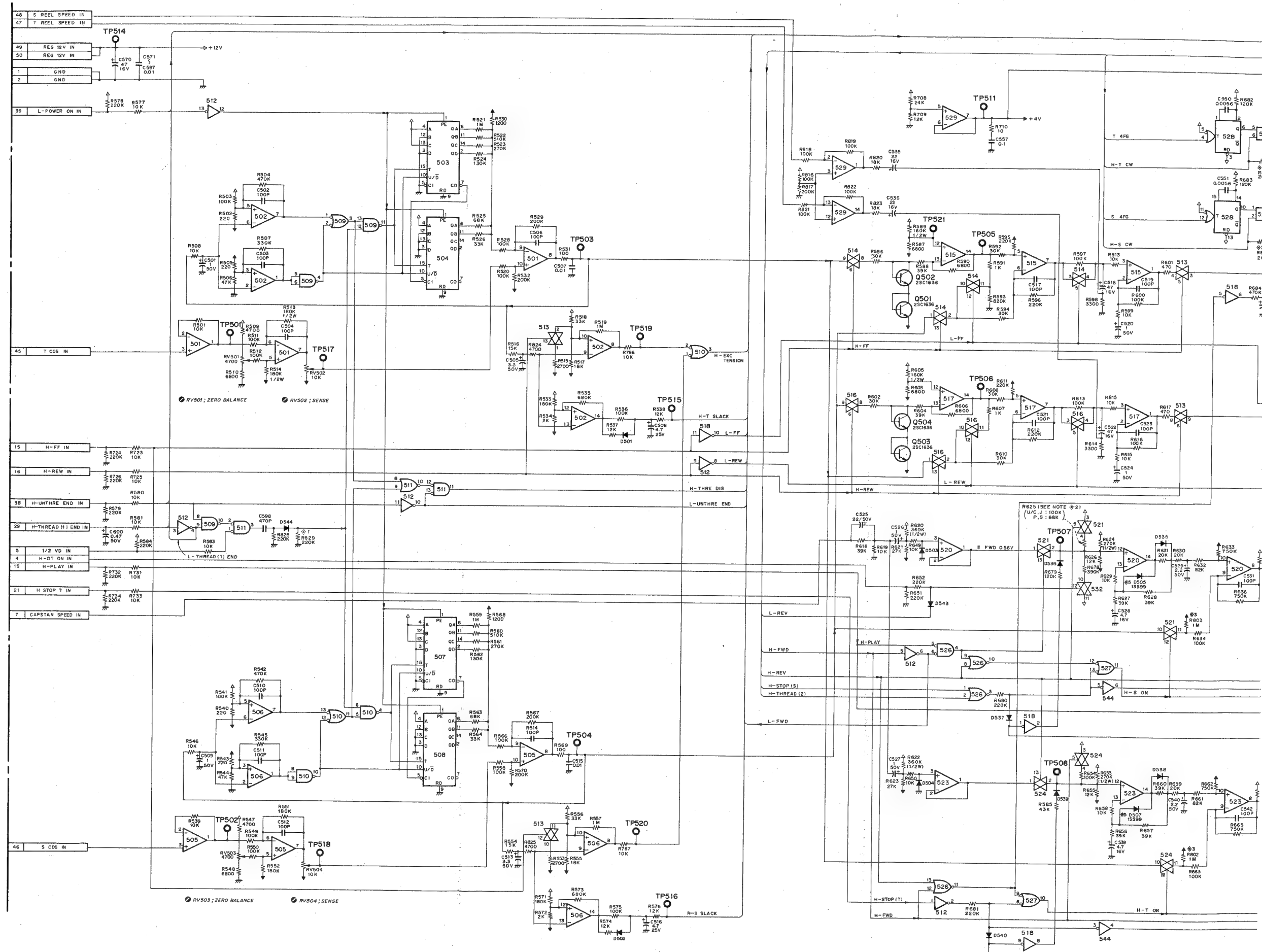


NOTE: ALL DIODES ARE 1S1555, UNLESS OTHERWISE SPECIFIED.

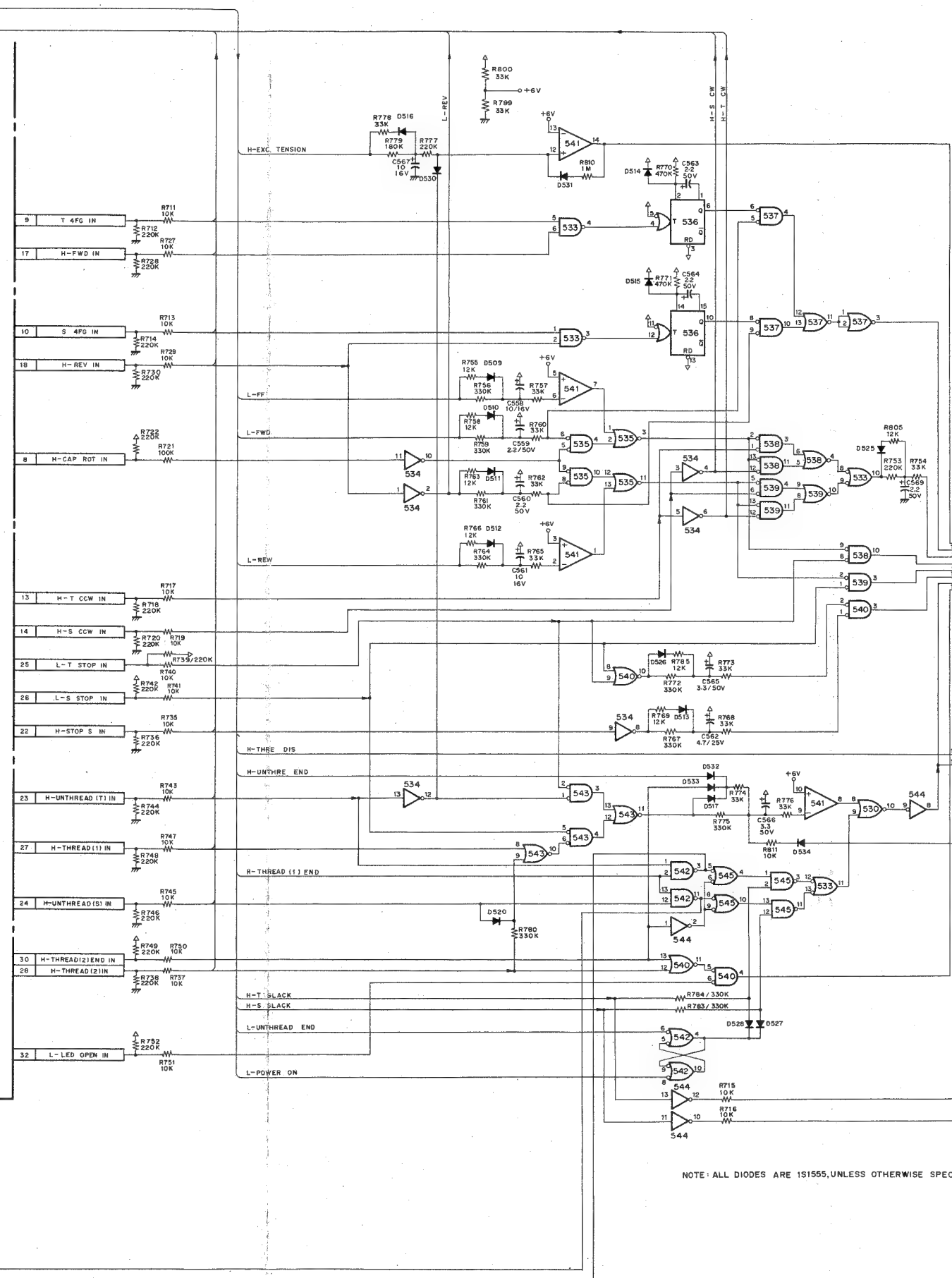
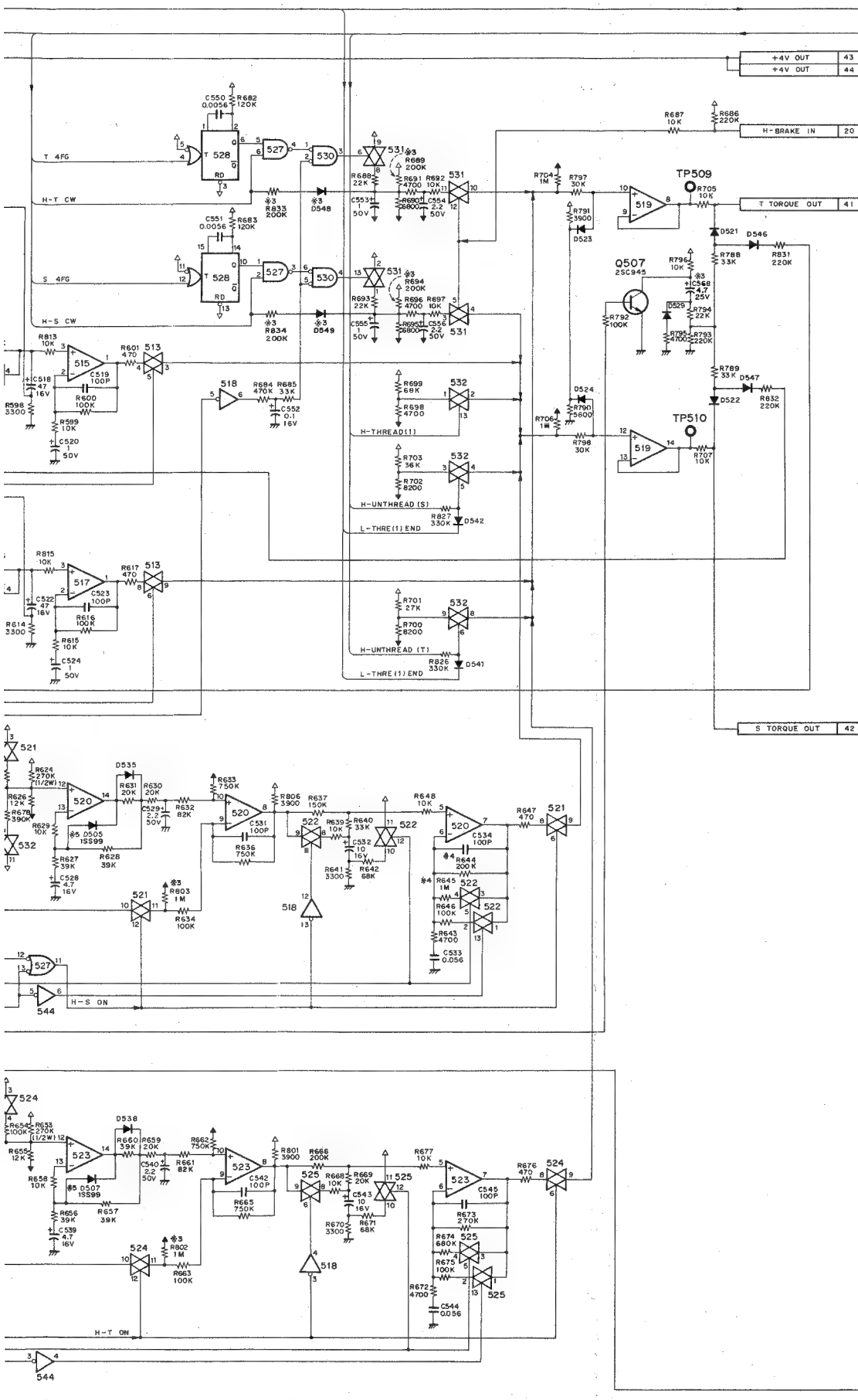
**RS-3**  
 I-604-335-13  
 BVU-820 (S/N.10996~(U/C))  
 BVU-820P (S/N.10691~)  
 BVU-820S (S/N.10051~)  
 BVU-820PM (S/N.10006~)



NOTE	CHANGE INFORMATION	SERIAL NO.
※ 1	R829 1M → 220K	U/C : 10746 ~ J : 10201 ~ P : 10501 ~ S : 10051 PM : 10006 ~
※ 2	R625 100K → 68K (PAL SECAM ONLY)	P : 10601 ~ S : 10051 ~
※ 3	CHANGE R699 100K → 200K R684 100K → 200K R602 560K → 1M R600 560K → 1M C568 1015V → 4.7/25V ADDITION R833/R834 D048/D549 R833 C568 D549 C553 IC527  W →  T HOT R834 C568 D549 C555 IC527  W →  T HOT	U/C 110996 ~ J : 11931 ~ P : 10689 ~ S : 11051 ~ PM 101006 ~
※ 4	R644 270K → 200K R645 580K → 1M	U/C : 11196 ~ J : 10401 ~ P : 10791 ~ S : 10051 ~ PM : 10011 ~
※ 5	D005, 507 151925P → 15399	U/C : 11214 ~ J : 10631 ~ P : 11681 ~ S : 10116 ~ PM : 10081 ~





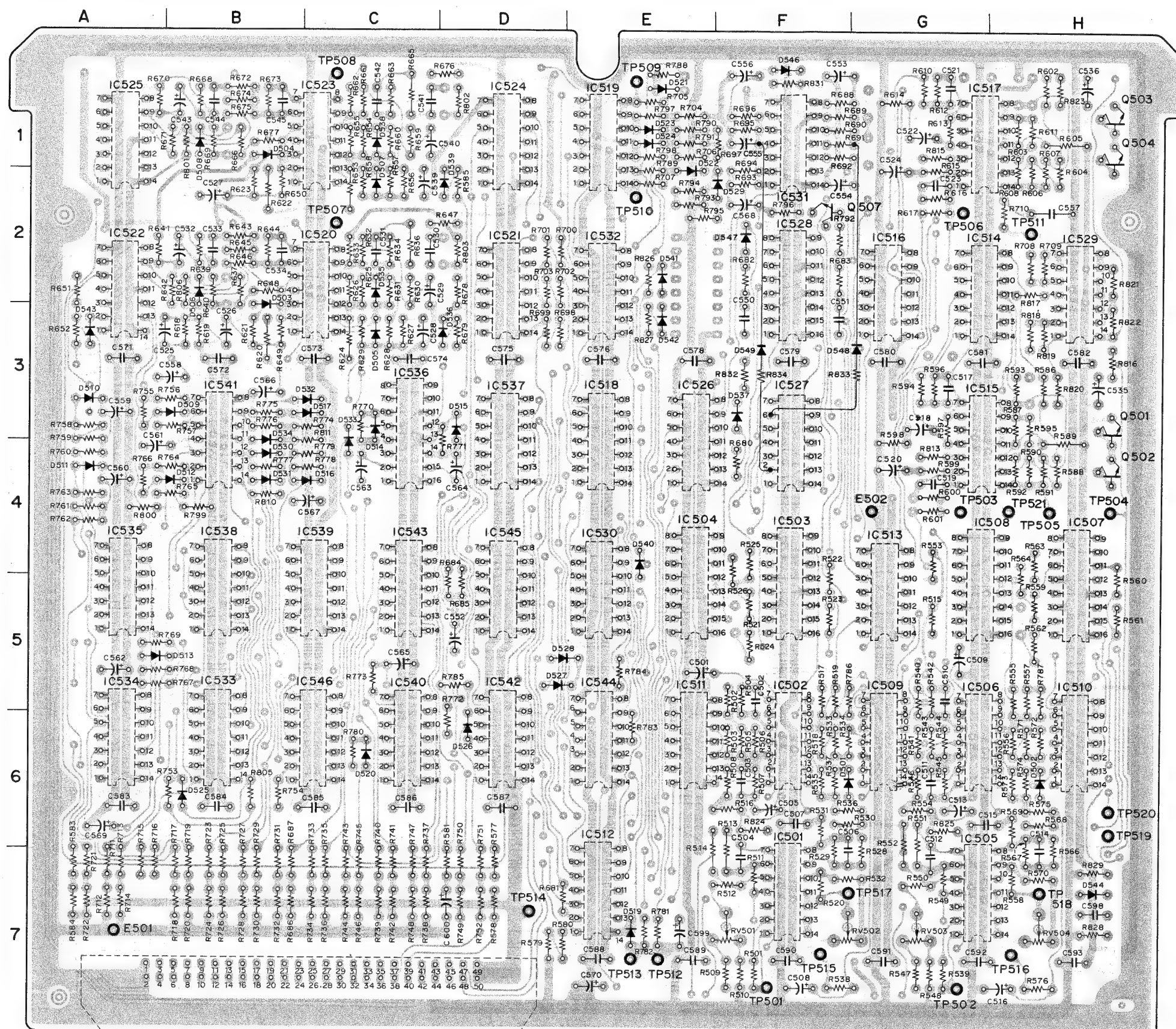


REF. NO.	TYPE	PIN NO.
IC 501	µPC324C, LM324	4 11
502	µPC324C, LM324	4 11
503	TC4516BP, MC14516BCP	16 8
504	TC4516BP, MC14516BCP	16 8
505	µPC324C, LM324	4 11
506	µPC324C, LM324	4 11
507	TC4516BP, MC14516BCP	16 8
508	TC4516BP, MC14516BCP	16 8
509	TC4011BP, CD4011BE	14 7
510	TC4011BP, CD4011BE	14 7
511	TC4001BP, CD4001BE	14 7
512	TC4066BP, CD4066BE	14 7
513	TC4066BP, CD4066BE	14 7
514	TC4066BP, CD4066BE	14 7
515	µPC324C, LM324	4 11
516	TC4066BP, CD4066BE	14 7
517	µPC324C, LM324	4 11
518	TC4066BP, CD4066BE	14 7
519	µPC324C, LM324	4 11
520	µPC324C, LM324	4 11
521	TC4066BP, CD4066BE	14 7
522	TC4066BP, CD4066BE	14 7
523	µPC324C, LM324	4 11
524	TC4066BP, CD4066BE	14 7
525	TC4066BP, CD4066BE	14 7
526	TC4001BP, CD4001BE	14 7
527	TC4011BP, CD4011BE	14 7
528	MC14538BCP, MD14538BP	16 8
529	µPC324C, LM324	4 11
530	TC4001BP, CD4001BE	14 7
531	TC4066BP, CD4066BE	14 7
532	TC4066BP, CD4066BE	14 7
533	TC4011BP, CD4011BE	14 7
534	TC4066BP, CD4066BE	14 7
535	TC4001BP, CD4001BE	14 7
536	MC14538BCP, MD14538BP	16 8
537	TC4001BP, CD4001BE	14 7
538	TC4001BP, CD4001BE	14 7
539	TC4001BP, CD4001BE	14 7
540	TC4001BP, CD4001BE	14 7
541	µPC324C, LM324	4 11
542	TC4011BP, CD4011BE	14 7
543	TC4001BP, CD4001BE	14 7
544	TC4066BP, CD4066BE	14 7
545	TC4011BP, CD4011BE	14 7
546	TC4078BP, CD4078BE	14 7

NOTE: ALL DIODES ARE 1S1555, UNLESS OTHERWISE SPECIFIED.

**RS-4**  
1-604-336-13,14  
BVU - 820  
BVU - 820P  
BVU - 820S  
BVU - 820PM





D501	G - 6	IC521	D - 2
D502	H - 6	IC522	A - 2
D503	B - 3	IC523	C - 1
D504	B - 1	IC524	D - 1
D505	C - 3	IC525	A - 1
D506	B - 2	IC526	E - 3
D507	C - 2	IC527	F - 4
D508	B - 1	IC528	F - 2
D509	B - 3	IC529	H - 2
D510	A - 3	IC530	E - 5
D511	A - 4	IC531	F - 1
D512	B - 4	IC532	E - 2
D513	A - 5	IC533	B - 6
D514	C - 3	IC534	A - 6
D515	D - 3	IC535	A - 5
D516	C - 4	IC536	C - 3
D517	C - 3	IC537	D - 3
D519	E - 7	IC538	B - 5
D520	C - 6	IC539	C - 6
D521	E - 1	IC540	C - 5
D522	E - 2	IC541	B - 3
D523	E - 1	IC542	D - 6
D524	E - 1	IC543	C - 5
D525	B - 6	IC544	E - 6
D526	D - 6	IC545	D - 5
D527	D - 5	IC546	C - 6
D528	E - 5		
D529	F - 2	Q501	H - 3
D530	B - 4	Q502	H - 4
D531	B - 4	Q503	H - 1
D532	C - 3	Q504	H - 1
D533	C - 4	Q507	F - 2
D534	B - 4		
D535	C - 2	RV501	F - 7
D536	D - 3	RV502	G - 7
D537	F - 3	RV503	G - 7
D538	C - 1	RV504	H - 7
D539	D - 2		
D540	E - 4	TP501	F - 7
D541	E - 2	TP502	G - 7
D542	E - 3	TP503	G - 4
D543	A - 3	TP504	H - 4
D544	H - 7	TP505	H - 4
D546	F - 1	TP506	G - 2
D547	F - 2	TP507	C - 2
D548	G - 3	TP508	C - 1
D549	F - 3	TP509	E - 1
		TP510	E - 2
E501	A - 7	TP511	H - 2
E502	G - 4	TP512	E - 7
		TP513	E - 7
IC501	F - 7	TP514	D - 7
IC502	F - 6	TP515	F - 7
IC503	F - 5	TP516	H - 7
IC504	E - 5	TP517	G - 7
IC505	G - 7	TP518	H - 7
IC506	G - 6	TP519	H - 6
IC507	H - 5	TP520	H - 6
IC508	G - 5	TP521	H - 4
IC509	G - 6		
IC510	H - 6		
IC511	E - 6		
IC512	E - 7		
IC513	G - 5		
IC514	G - 2		
IC515	G - 4		
IC516	G - 2		
IC517	G - 1		
IC518	E - 3		
IC519	E - 1		
IC520	C - 2		

**RS-4** — SOLDERING SIDE —  
1-604-336-13,14  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM

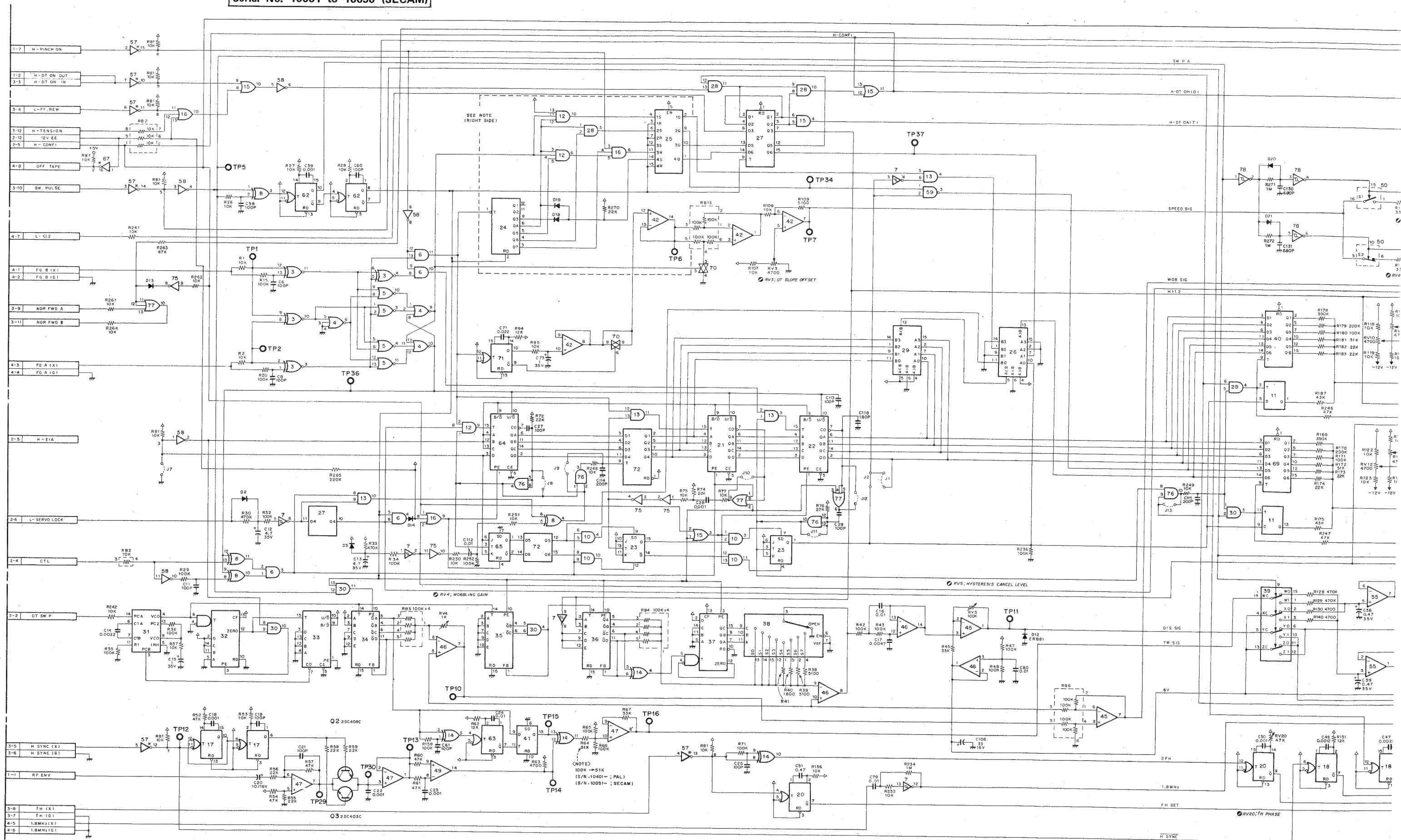




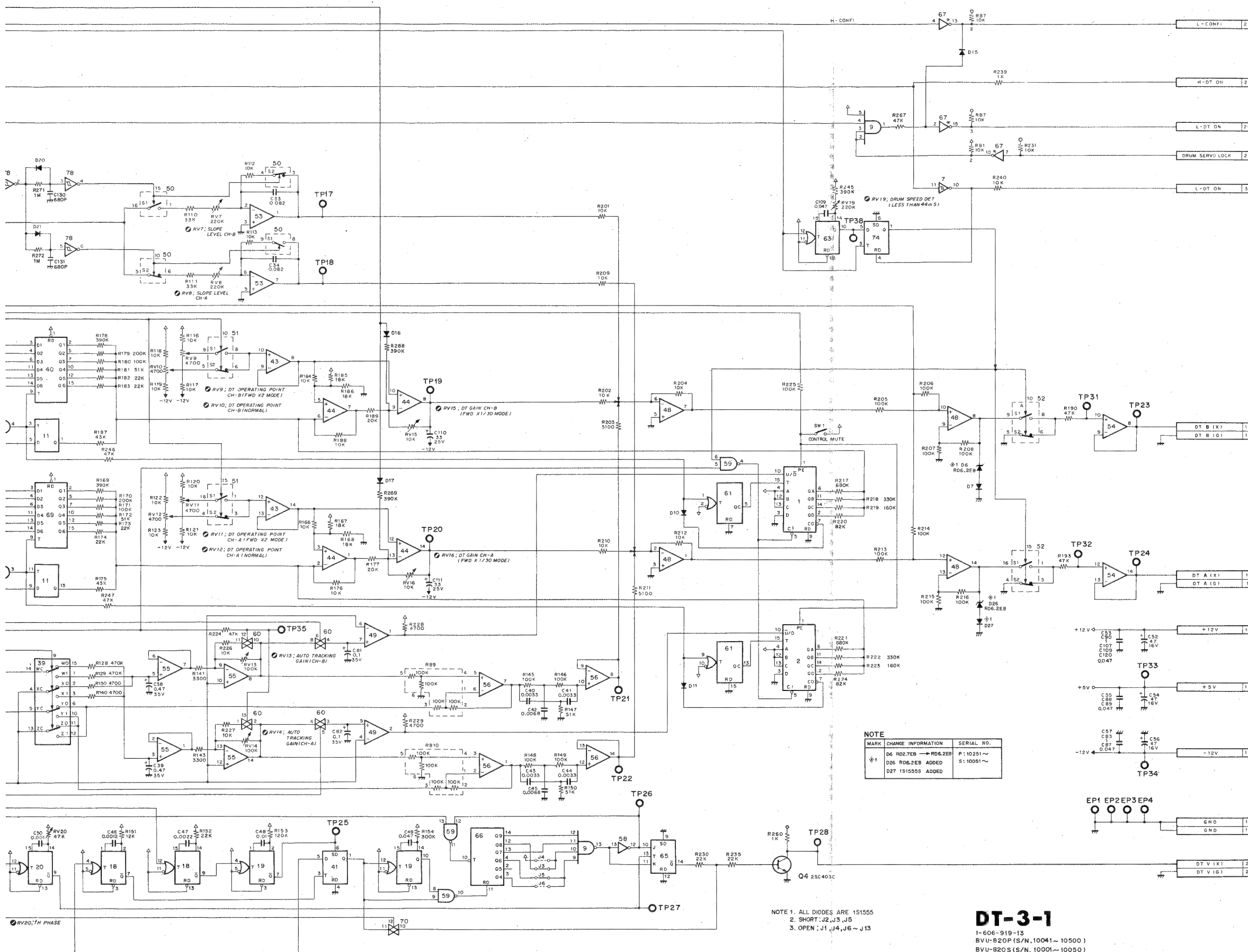


## DT-3-1 (DYNAMIC TRACKING CONTROL)

Serial No. 10041 to 10500 (PAL)  
Serial No. 10001 to 10050 (SECAM)

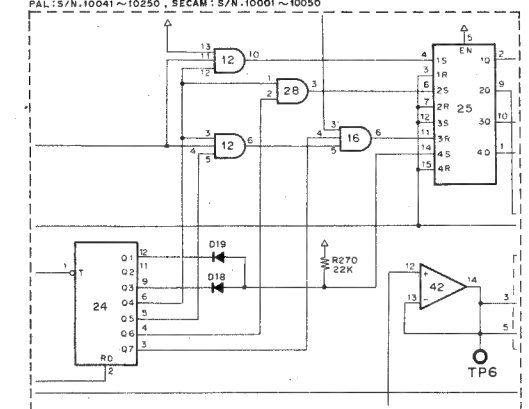






17-75(a)

NOTE



REF. NO.	TYPE	PIN NO.	+12V	+5V	GND	-12V
IC 1	TC4516BP, MC14516B	16	8			
IC 2	TC4516BP, MC14516B	16	8			
IC 3	MC14077BCP, CD4077BE	14	7			
IC 4	TC4025BP, CD4025BE	14	7			
IC 5	TC4001BP, CD4001BE	14	7			
IC 6	TC4081BP, CD4081BE	14	7			
IC 7	MC14584BCP	14	7			
IC 8	TC4030BP, CD4030BE	14	7			
IC 9	TC4082BP, CD4082BE	14	7			
IC 10	TC4081BP, CD4081BE	14	7			
IC 11	TC4033BP, CD4033BE	14	7			
IC 12	TC4073BP, CD4073BE	14	7			
IC 13	TC4081BP, CD4081BE	14	7			
IC 14	TC4030BP, CD4030BE	14	7			
IC 15	TC4071BP, CD4071BE	14	7			
IC 16	TC4075BP, CD4075BE	14	7			
IC 17	μPD4528C, MC14528BCP	16	8			
IC 18	HD14538BP	16	8			
IC 19	HD14538BP	16	8			
IC 20	HD14538BP	16	8			
IC 21	TC4029BP, CD4029BE	16	8			
IC 22	TC4029BP, CD4029BE	16	8			
IC 23	TC4027BP, CD4027BE	16	8			
IC 24	TC4024BP, CD4024BE	14	7			
IC 25	TC4043BP, CD4043BE	16	8			
IC 26	TC4585BP, MC14585BCP	16	8			
IC 27	TC40174BP, MC14174BCP	16	8			
IC 28	TC4081BP, CD4081BE	14	7			
IC 29	TC4585BP, MC14585BCP	16	8			
IC 30	TC4081BP, CD4081BE	14	7			
IC 31	MC14046BCP, CD4046BE	16	8			
IC 32	MC14526BCP	16	8			
IC 33	TC4029BP, CD4029BE	16	8			
IC 34	TC4018BP, CD4018BE	16	8			
IC 35	TC4018BP, CD4018BE	16	8			
IC 36	TC4018BP, CD4018BE	16	8			
IC 37	MC14526BCP	16	8			
IC 38	TC4051BP, CD4051BE	16	8			
IC 39	MC14551BCP	16	8			
IC 40	TC40174BP, MC14174BCP	16	8			
IC 41	TC4013BP, CD4013BE	14	7			
IC 42	μPC324C, LM324	4	11			
IC 43	μPC324C, LM324	4	11			
IC 44	μPC324C, LM324	4	11			
IC 45	μPC4558C, RC4558	8	4			
IC 46	μPC324C, LM324	4	11			
IC 47	μPC324C, LM324	4	11			
IC 48	μPC324C, LM324	4	11			
IC 49	TL191CN	11	12	13	14	
IC 50	TL191CN	11	12	13	14	
IC 51	TL191CN	11	12	13	14	
IC 52	TL191CN	11	12	13	14	
IC 53	μPC4558C, RC4558	8	4			
IC 54	μPC324C, LM324	4	11			
IC 55	μPC324C, LM324	4	11			
IC 56	μPC324C, LM324	4	11			
IC 57	M54517P	4	8			
IC 58	TC4069UBP, CD4069UBE	14	7			
IC 59	TC4011BP, CD4011BE	14	7			
IC 60	TC4066BP, CD4066BE	14	7			
IC 61	TC4520BP, MC14520BCP	16	8			
IC 62	μPD4528C, MC14528BCP	16	8			
IC 63	HD14538BP	16	8			
IC 64	TC4029BP, CD4029BE	16	8			
IC 65	TC4027BP, CD4027BE	16	8			
IC 66	TC4040BP, CD4040BE	16	8			
IC 67	M54517P	4	8			
IC 68	TL191CN	11	12	13	14	
IC 69	TC40174BP, MC14174BCP	16	8			
IC 70	TC4066BP, CD4066BE	14	7			
IC 71	MC14538BCP	16	8			
IC 72	TC40174BP, MC14174BCP	16	8			
IC 73	μPC324C, LM324	4	11			
IC 74	TC4013BP, CD4013BE	14	7			
IC 75	MC14584BCP	14	7			
IC 76	TC4081BP, CD4081BE	14	7			
IC 77	TC4075BP, CD4075BE	14	7			
IC 78	MC14584BCP	14	7			

## DT-3-1

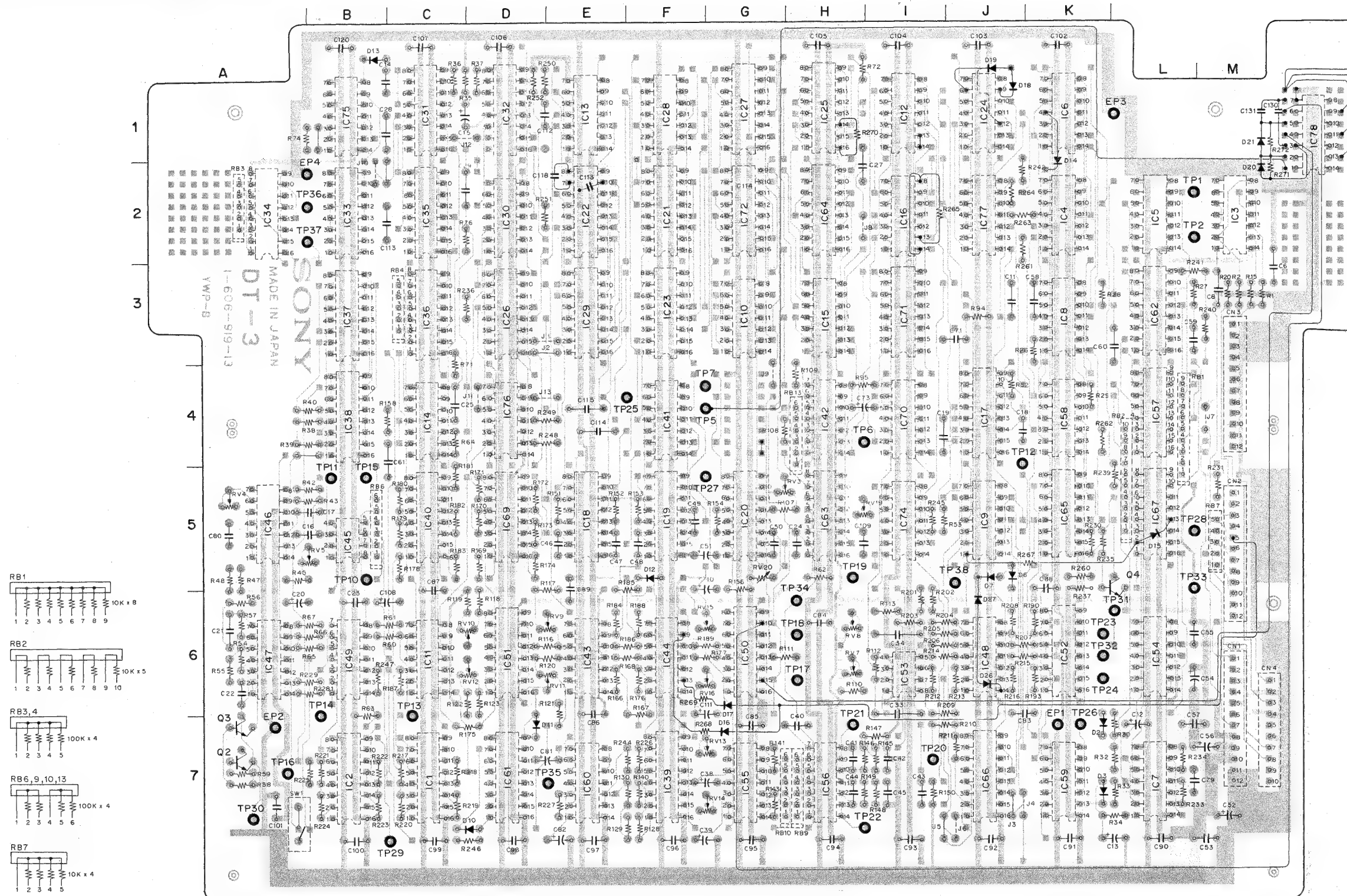
1-606-919-13  
BVU-920P (S/N. 10041 ~ 10500)  
BVU-920S (S/N. 10001 ~ 10050)

17-76(a)



DT-3-1 (DYNAMIC TRACKING CONTROL)

Serial No. 10041 to 10500 (PAL)  
Serial No. 10001 to 10050 (SECAM)



CN1	M-7	IC58	K-4
CN2	M-5	IC59	K-7
CN3	M-4	IC60	E-7
CN4	M-7	IC61	D-7
		IC62	L-3
D2	K-7	IC63	H-5
D3	K-7	IC64	H-2
D6	J-5	IC65	K-5
D7	J-5	IC66	J-7
D10	D-7	IC67	L-5
D11	D-7	IC68	D-5
D12	F-5	IC70	I-4
D13	B-1	IC71	I-3
D14	K-1	IC72	G-2
D15	L-5	IC74	I-5
D16	G-7	IC75	B-1
D17	G-6	IC76	D-4
D18	J-1	IC77	J-2
D19	J-1	IC78	M-1
D20	M-1		
D21	M-1	Q2	A-7
D26	J-5	Q3	A-7
D27	J-6	Q4	L-5
EP1	K-7	RB1	L-4
EP2	A-7	RB2	L-5
EP3	L-1	RB3	A-2
EP4	A-2	RB4	C-3
		RB6	B-5
IC1	C-7	RB7	M-5
IC2	B-7	RB9	H-7
IC3	M-2	RB10	G-7
IC4	K-2	RB13	H-4
IC5	L-2		
IC6	K-1	RV3	G-5
IC7	L-7	RV4	A-5
IC8	K-3	RV5	A-5
IC9	J-5	RV7	H-6
IC10	G-3	RV8	H-6
IC11	C-6	RV9	D-6
IC12	I-1	RV10	C-6
IC13	E-1	RV11	D-6
IC14	C-4	RV12	C-6
IC15	H-3	RV13	F-7
IC16	I-2	RV14	F-7
IC17	J-4	RV15	F-6
IC18	E-5	RV16	F-6
IC19	F-5	RV19	H-5
IC20	G-5	RV20	G-5
IC21	F-2		
IC22	E-2	TP1	M-2
IC23	F-3	TP2	M-2
IC24	J-1	TP5	F-4
IC25	H-1	TP6	H-4
IC26	D-3	TP7	F-4
IC27	G-1	TP10	B-5
IC28	F-1	TP11	B-5
IC29	E-3	TP12	J-4
IC30	D-2	TP13	C-7
IC31	C-1	TP14	B-7
IC32	D-1	TP15	B-5
IC33	B-2	TP16	A-7
IC34	A-2	TP17	H-6
IC35	C-2	TP18	H-6
IC36	C-3	TP19	H-5
IC37	B-3	TP20	I-7
IC38	B-4	TP21	H-7
IC39	F-7	TP22	H-7
IC40	C-5	TP23	K-6
IC41	F-4	TP24	K-6
IC42	H-4	TP25	E-4
IC43	E-6	TP26	K-7
IC44	F-6	TP27	F-5
IC45	B-5	TP28	M-5
IC46	A-5	TP29	B-7
IC47	A-6	TP30	A-7
IC48	J-6	TP31	L-6
IC49	B-6	TP32	K-6
IC50	G-6	TP33	L-6
IC51	D-6	TP34	H-6
IC52	K-6	TP35	D-7
IC53	I-6	TP36	B-2
IC54	L-6	TP37	A-2
IC55	G-7	TP38	J-5
IC56	H-7		
IC57	L-4		

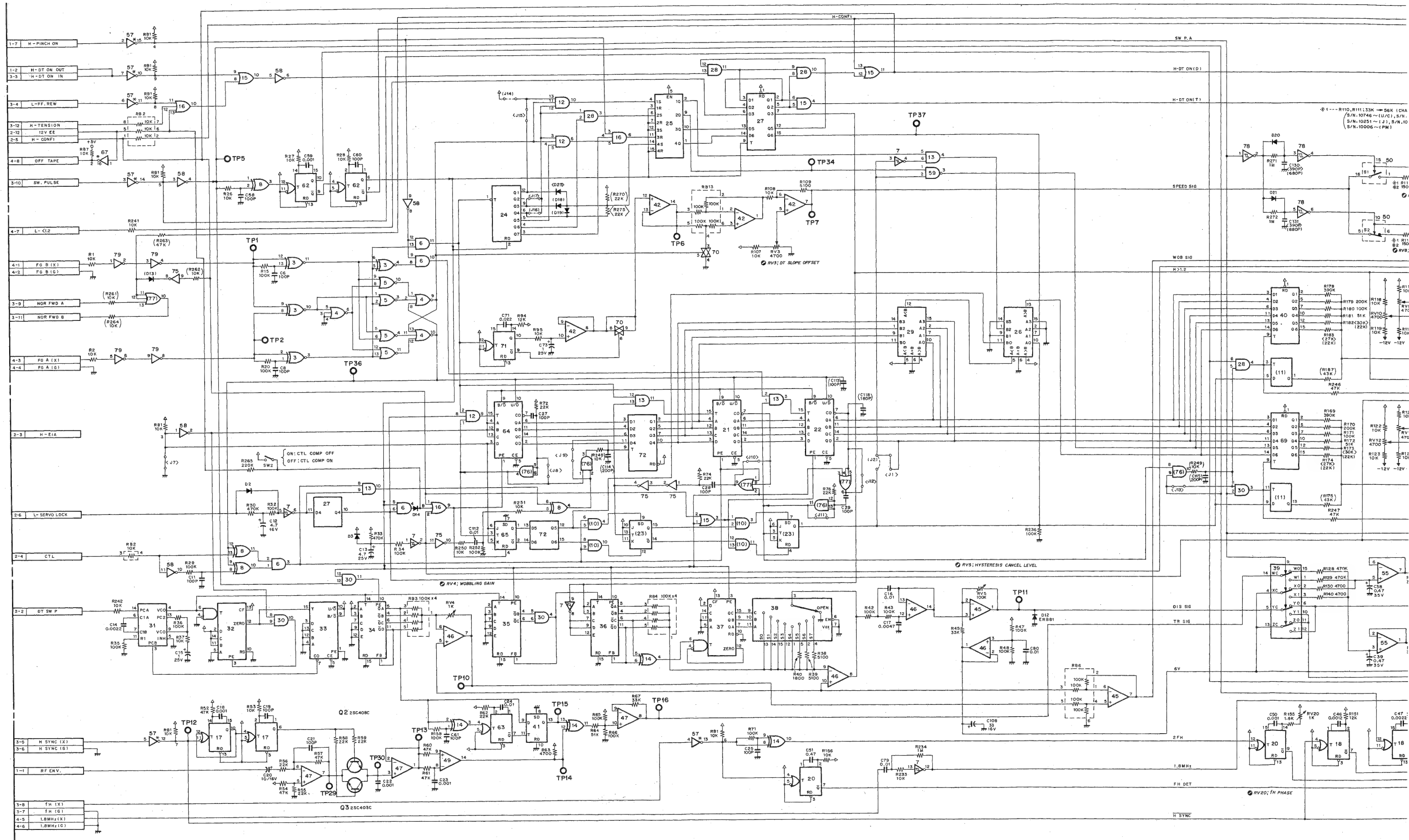
DT-3-1 — SOLDERING SIDE —  
1-606-919-13  
BVU-820P (S/N.10041~10500)  
BVU-820S (S/N.10001~10050)

NOTE 1. SHORT: J2, J3, J5  
2. OPEN: J1, J4, J6~J13

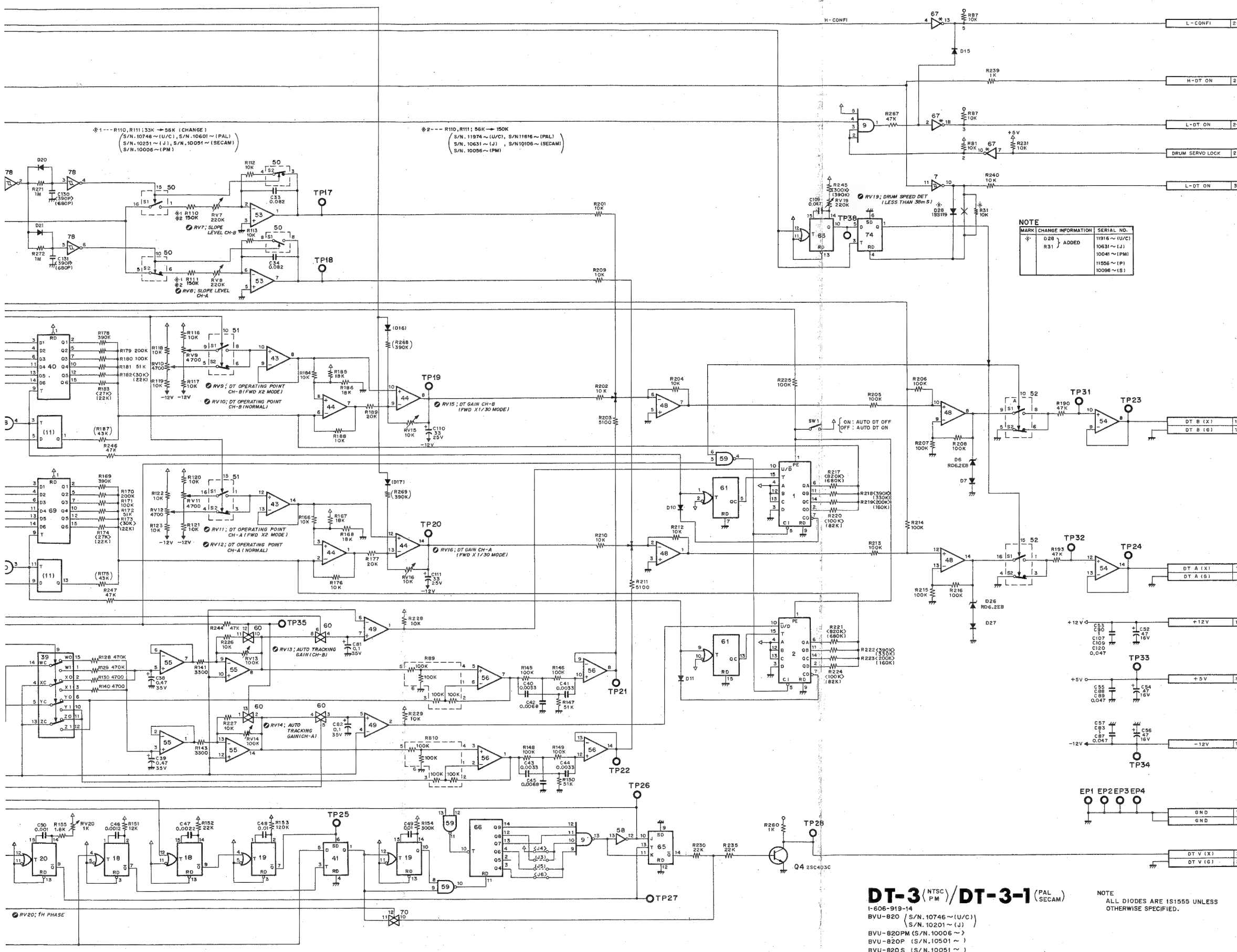












NOTE: DIFFERENCE BETWEEN NTSC, PM AND PAL, SECAM

SYSTEMS

(1) O = Mounted, X = Not mounted (open)

(2) The parts with mark X in the schematic diagram are only for the NTSC, PM systems.

(3) The parts with mark ( ) in the schematic diagram are only for the PAL, SECAM systems

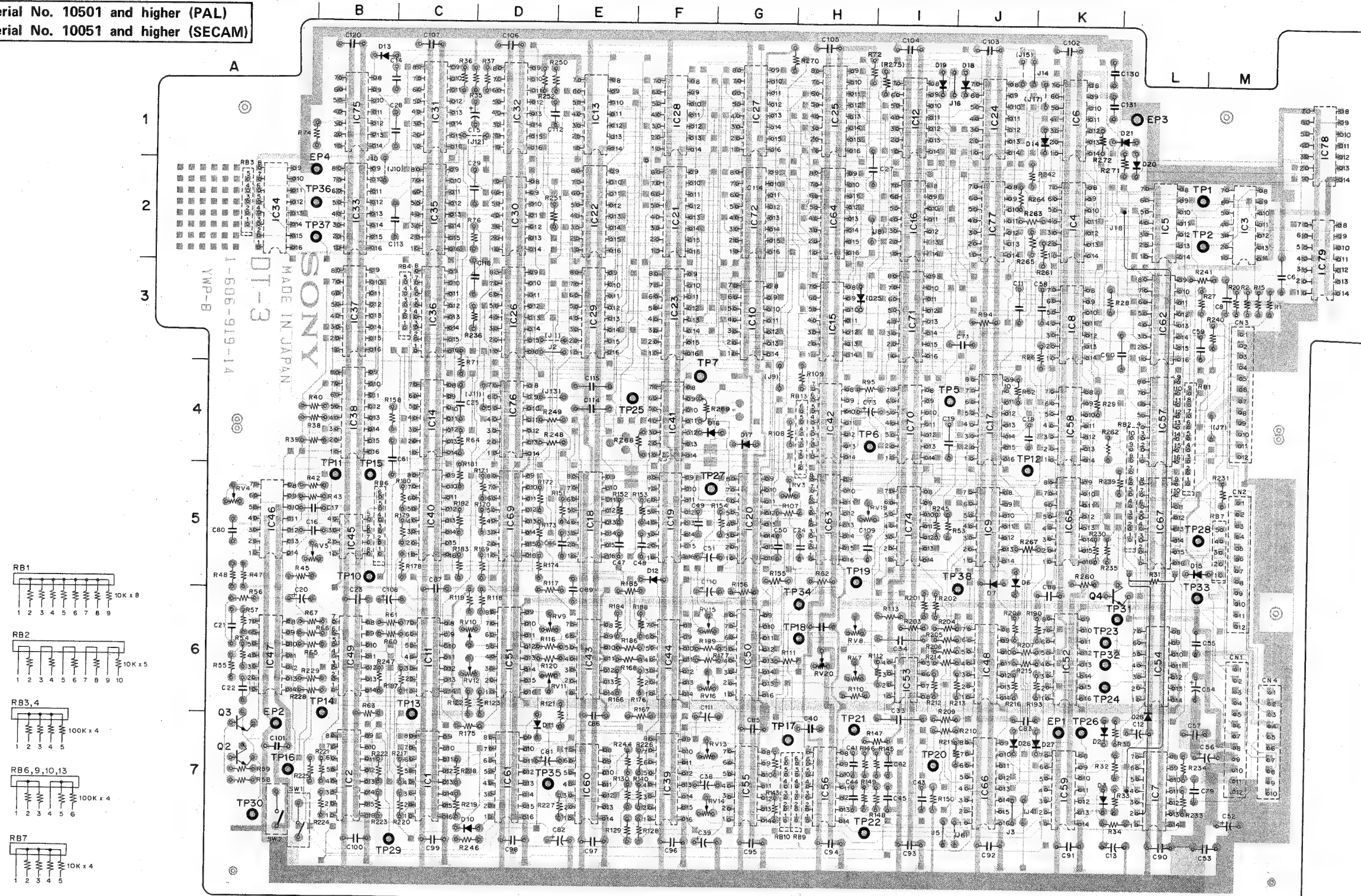
SYSTEM REF. NO.	NTSC	PM	PAL	SECAM	SYSTEM REF. NO.	NTSC	PM	PAL	SECAM
C113	X	O			J14	X	O		
C114	X	O			J15	O	X		
C115	X	O			J16	X	O		
C118	X	O			J17	O	X		
C130	390P	680P							
C131	390P	680P							
D13	X	O			R173	30K	22K		
D16	X	O			R174	27K	22K		
D17	X	O			R175	X	O		
D18	X	O			R182	30K	22K		
D19	X	O			R183	27K	22K		
D25	O	X			R187	X	O		
IC10	X	O			R217	820K	680K		
IC11	X	O			R218	390K	330K		
IC23	X	O			R219	200K	160K		
IC76	X	O			R220	100K	82K		
IC77	X	O			R221	820K	680K		
J1	O	X			R222	390K	300K		
J2	X	O			R223	200K	160K		
J3	X	O			R224	100K	82K		
J4	O	X							
J5	X	O			R245	300K	390K		
J6	O	X			R246	X	O		
J7	O	X			R249	X	O		
J8	O	X			R261	X	O		
J9	O	X			R262	X	O		
J10	O	X			R263	X	O		
J11	O	X			R264	X	O		
J12	O	X			R265	X	O		
J13	O	X			R269	X	O		
					R270	X	O		
					R275	O	X		

REF. NO.	TYPE	+12V	+5V	GND	-12V
IC 1	TC4516BP, MC14516BCP	16	8		
IC 2	TC4516BP, MC14516BCP	16	8		
IC 3	MC14077BP, CD4077BE	14	7		
IC 4	TC4025BP, CD4025BE	14	7		
IC 5	TC4001BP, CD4001BE	14	7		
IC 6	TC4081BP, CD4081BE	14	7		
IC 7	MC14584BCP	14	7		
IC 8	TC4030BP, CD4030BE	14	7		
IC 9	TC4082BP, CD4082BE	14	7		
(IC 10)	TC4081BP, CD4081BE	14	7		
(IC 11)	TC4013BP, CD4013BE	14	7		
IC 12	TC4073BP, CD4073BE	14	7		
IC 13	TC4081BP, CD4081BE	14	7		
IC 14	TC4030BP, CD4030BE	14	7		
IC 15	TC4071BP, CD4071BE	14	7		
IC 16	TC4075BP, CD4075BE	14	7		
IC 17	μPD4528C, MC14528BCP	16	8		
IC 18	HD14538BP	16	8		
IC 19	HD14538BP	16	8		
IC 20	HD14538BP	16	8		
IC 21	TC4029BP, CD4029BE	16	8		
IC 22	TC4029BP, CD4029BE	16	8		
(IC 23)	TC4027BP, CD4027BE	16	8		
IC 24	TC4024BP, CD4024BE	14	7		
IC 25	TC4043BP, CD4043BE	16	8		
IC 26	TC4585BP, MC14585BCP	16	8		
IC 27	TC4017BP, MC14017BCP	16	8		
IC 28	TC4081BP, CD4081BE	14	7		
IC 29	TC4585BP, MC14585BCP	16	8		
IC 30	TC4081BP, CD4081BE	14	7		
IC 31	MC14046BCP, CD4046BE	16	8		
IC 32	MC14526BCP	16	8		
IC 33	TC4029BP, CD4029BE	16	8		
IC 34	TC4018BP, CD4018BE	16	8		
IC 35	TC4018BP, CD4018BE	16	8		
IC 36	TC4018BP, CD4018BE	16	8		
IC 37	MC14526BCP	16	8		
IC 38	TC4051BP, CD4051BE	16	8		
IC 39	MC14551BCP	16	8		
IC 40	TC4017BP, MC14017BCP	16	8		
IC 41	TC4013BP, CD4013BE	14	7		
IC 42	μPC324C, LM324	4	11		
IC 43	μPC324C, LM324	4	11		
IC 44	μPC324C, LM324	4	11		
IC 45	μPC4558C, RC4558	8	4		
IC 46	μPC324C, LM324	4	11		
IC 47	μPC324C, LM324	4	11		
IC 48	μPC324C, LM324	4	11		
IC 49	NJM2901N	3	12	13	14
IC 50	TL191CN	11	12	13	14
IC 51	TL191CN	11	12	13	14
IC 52	TL191CN	11	12	13	14
IC 53	μPC4558C, RC4558	8	4		
IC 54	μPC324C, LM324	4	11		
IC 55	μPC324C, LM324	4	11		
IC 56	μPC324C, LM324	4	11		
IC 57	M54517P	4	8		
IC 58	TC4069BP, CD4069BE	14	7		
IC 59	TC4011BP, CD4011BE	14	7		
IC 60	TC4066BP, CD4066BE	14	7		
IC 61	TC4520BP, MC14520BCP	16	8		
IC 62	μPD4528C, MC14528BCP	16	8		
IC 63	HD14538BP	16	8		
IC 64	TC4029BP, CD4029BE	16	8		
IC 65	TC4027BP, CD4027BE	16	8		
IC 66	TC4040BP, CD4040BE	16	8		
IC 67	M54517P	4	8		
IC 68	TL191CN	11	12	13	14
IC 69	TC4017BP, MC14017BCP	16	8		
IC 70	TC4066BP, CD4066BE	14	7		
IC 71	MC14538BCP	16	8		
IC 72	TC4017BP, MC14017BCP	16	8		
IC 73	μPC324C, LM324	4	11		
IC 74	TC4013BP, CD4013BE	14	7		
IC 75	MC14584BCP	14	7		
(IC 76)	TC4081BP, CD4081BE	14	7		
(IC 77)	TC4075BP, CD4075BE	14	7		
IC 78	MC14584BCP	14	7		
IC 79	MC14584BCP	14	7		



## DT-3-1 (DYNAMIC TRACKING CONTROL)

Serial No. 10501 and higher (PAL)  
Serial No. 10051 and higher (SECAM)



CN1 M-7	IC58 K-4
CN2 M-5	IC59 K-7
CN3 M-4	IC60 E-7
CN4 M-7	IC61 D-7
	IC62 L-3
D2 K-7	IC63 H-5
D3 K-7	IC64 H-2
D6 J-5	IC65 K-5
D7 J-5	IC66 J-7
D10 D-7	IC67 L-5
D11 D-7	IC69 D-5
D12 F-5	IC70 I-4
D13 B-1	IC71 I-3
D14 K-1	IC72 G-2
D15 M-5	IC74 I-5
D16 F-4	IC75 B-1
D17 G-4	IC76 D-4
D18 J-1	IC77 J-2
D19 I-1	IC78 M-1
D20 L-2	IC79 M-2
D21 L-1	
(D25 H-3)	Q2 A-7
D26 J-7	Q3 A-7
D27 K-7	Q4 L-5
D28 L-7	
EP1 K-7	RB1 L-4
EP2 A-7	RB2 L-5
EP3 L-1	RB3 A-2
EP4 A-2	RB4 C-3
	RB6 B-5
	RB7 M-5
	RB9 H-7
IC1 C-7	RB10 G-7
IC2 B-7	RB13 H-4
IC3 M-2	
IC4 K-2	RV3 G-5
IC5 L-2	RV4 A-5
IC6 K-1	RV5 A-5
IC7 L-7	RV6 H-6
IC8 K-3	RV7 H-6
IC9 J-5	RV8 D-6
IC10 G-3	RV9 D-6
IC11 C-6	RV10 C-6
IC12 I-1	RV11 D-6
IC13 E-1	RV12 C-6
IC14 C-4	RV13 F-7
IC15 H-3	RV14 F-7
IC16 I-2	RV15 F-6
IC17 J-4	RV16 F-6
IC18 E-5	RV19 H-5
IC19 F-5	RV20 H-6
IC20 G-5	
IC21 F-2	SW1 A-7
IC22 E-2	SW2 A-7
IC23 F-3	
IC24 J-1	TP1 M-2
IC25 H-1	TP2 M-2
IC26 D-3	TP5 J-4
IC27 G-1	TP6 H-4
IC28 F-1	TP7 F-4
IC29 E-3	TP10 B-5
IC30 D-2	TP11 B-5
IC31 C-1	TP12 J-4
IC32 D-1	TP13 C-7
IC33 B-2	TP14 B-7
IC34 A-2	TP15 B-5
IC35 C-2	TP16 A-7
IC36 C-3	TP17 H-7
IC37 B-3	TP18 H-6
IC38 B-4	TP19 H-5
IC39 F-7	TP20 I-7
IC40 C-5	TP21 H-7
IC41 F-4	TP22 H-7
IC42 H-4	TP23 K-6
IC43 E-6	TP24 K-6
IC44 F-6	TP25 E-4
IC45 B-5	TP26 K-7
IC46 A-5	TP27 F-5
IC47 A-6	TP28 M-5
IC48 J-6	TP29 B-7
IC49 B-6	TP30 A-7
IC50 G-6	TP31 L-6
IC51 D-6	TP32 K-6
IC52 K-6	TP33 L-6
IC53 I-6	TP34 H-6
IC54 L-6	TP35 D-7
IC55 G-7	TP36 B-2
IC56 H-7	TP37 A-2
IC57 L-4	TP38 J-5

NOTE: ( ) = NOT MOUNTED PAL/SECAM MACHINE  
D25, J1, J8, J12, R275  
J4, J9, J13  
J6, J10, J15  
J7, J11, J17

DT-3-1 — SOLDERING SIDE —  
1-606-919-14  
BVU-820P(S/N.10501~)  
BVU-820S(S/N.10051~)





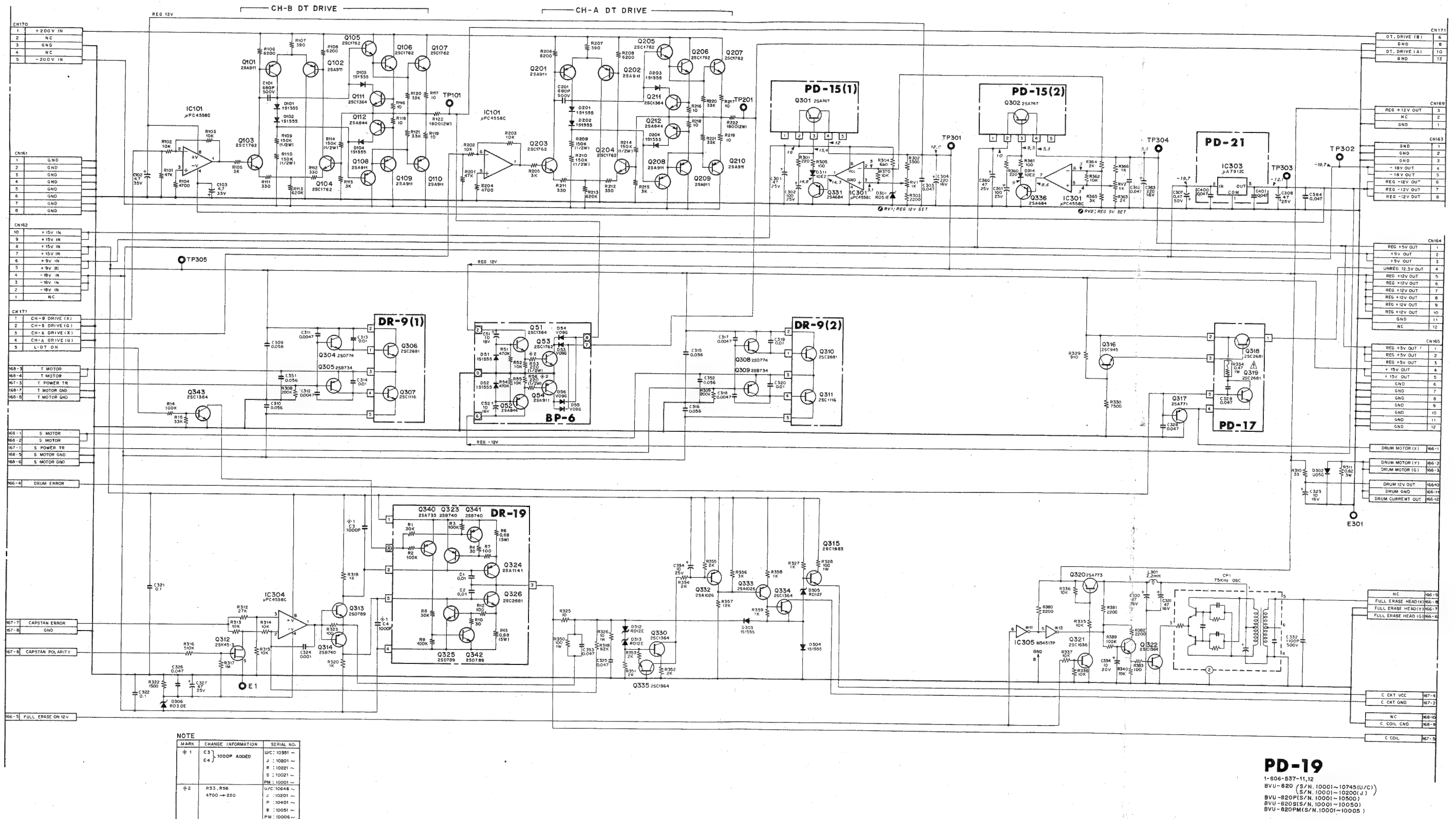


PD-19, PD-15, PD-17, PD-21, DR-9, DR-19, BP-6

PD-19, PD-15, PD-17, PD-21, DR-9, DR-19, BP-6

PD-19, PD-15, PD-17, PD-21, DR-9, DR-19, BP-6 (POWER DRIVE)  
(POWER SUPPLY)

Serial No. Up to 10500 (PAL)  
Serial No. Up to 10050 (SECAM)



17-81(a)

17-82(a)

**NOTE:**

The shaded and  $\Delta$ -marked components are critical to safety.  
Replace only with same components as specified.





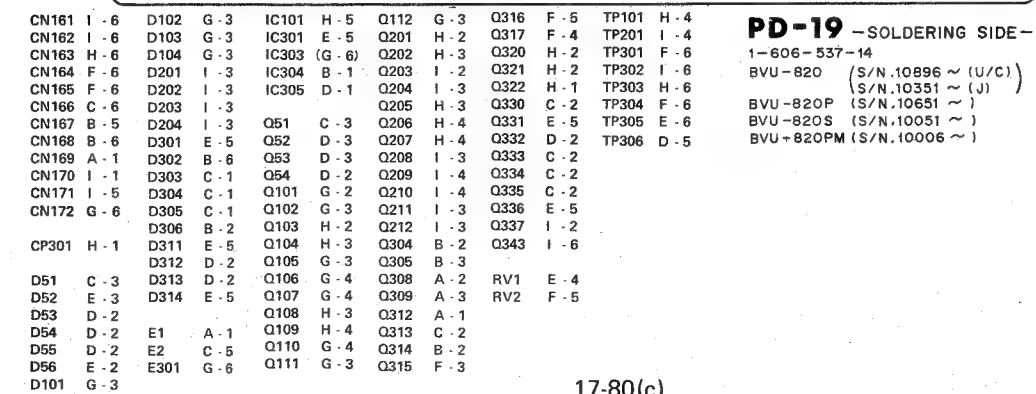
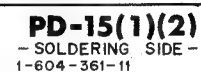
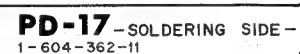
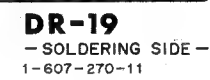






**PD-19, PD-15, PD-17, PD-21, DR-9, DR-19**

Serial No. 10651 and higher (PAL)
Serial No. 10051 and higher (SECAM)



17-80(c)

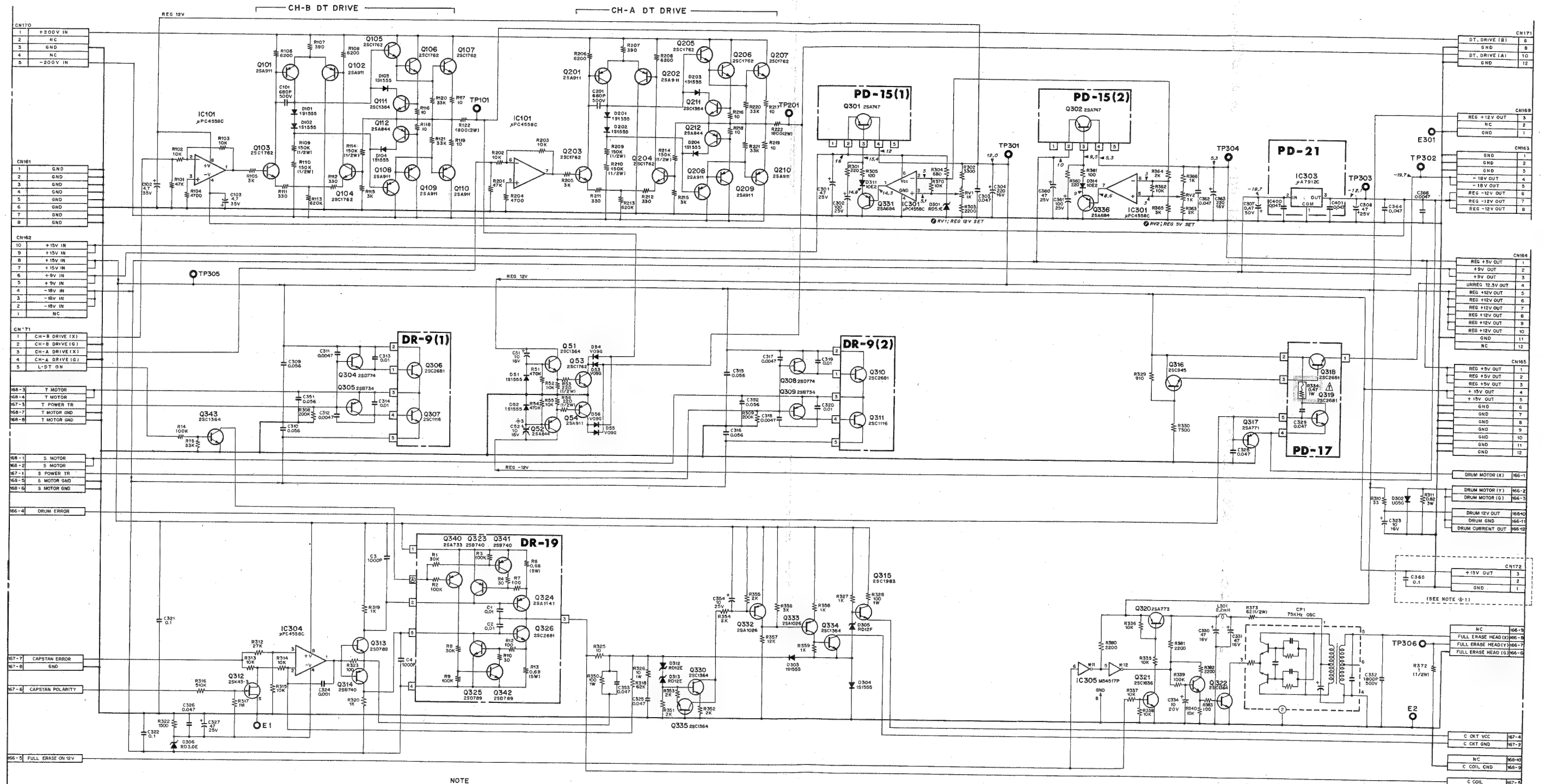


PD-19, PD-15, PD-17, PD-21, DR-9, DR-19

PD-19, PD-15, PD-17, PD-21, DR-9, DR-19

PD-19, PD-15, PD-17, PD-21, DR-9, DR-19 (POWER DRIVE)  
(POWER SUPPLY)

Serial No. 10501 and higher (PAL)  
Serial No. 10051 and higher (SECAM)



MARK	CHANGE INFORMATION	SERIAL NO.
1	CH172 ADD C355 0.1 ADD	10896 ~ (U/C) 10351 ~ (J) 10651 ~ (P) 10051 ~ (S) 10006 ~ (PM)
2	C366 0.0047 ADD	11806 ~ (U/C) 10800 ~ (J) 11326 ~ (P) 10086 ~ (S) 10021 ~ (PM)
3	C32 DELETE	11916 ~ (U/C) 10631 ~ (J) 11556 ~ (P) 10096 ~ (S) 10041 ~ (PM)

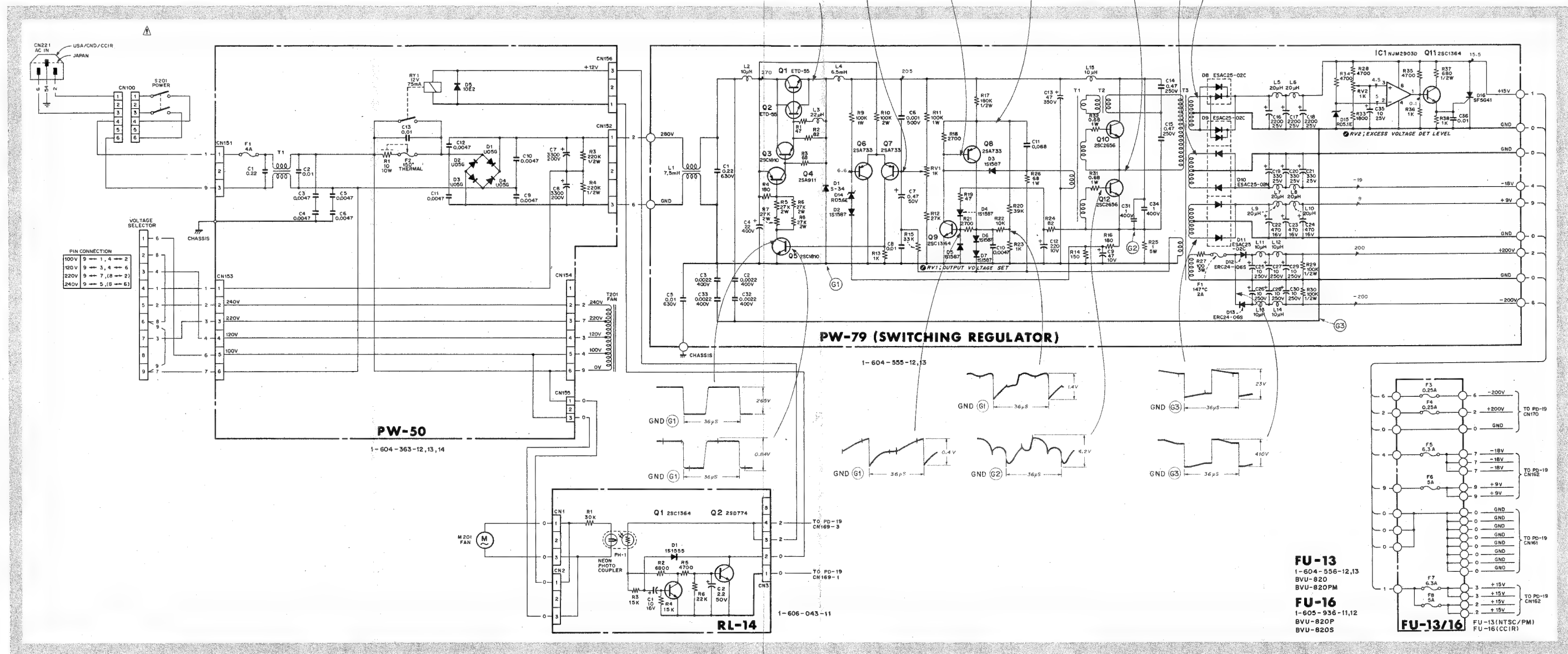
**PD-19**

1-606-537-13,14  
SVU-820 (S/N. 10746 ~ (U/C))  
SVU-820P (S/N. 10501 ~ (J))  
SVU-820S (S/N. 10051 ~ (S))  
SVU-820PM (S/N. 10006 ~ (PM))



PW-50, RL-14 (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-16 (FUSE BOARD)

SER. No. Up to 10600 (PAL)  
SER. No. Up to 10050 (SECAM)



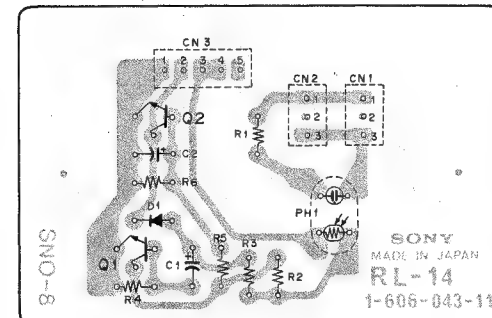


PW-50, RL-14, PW-79, FU-16

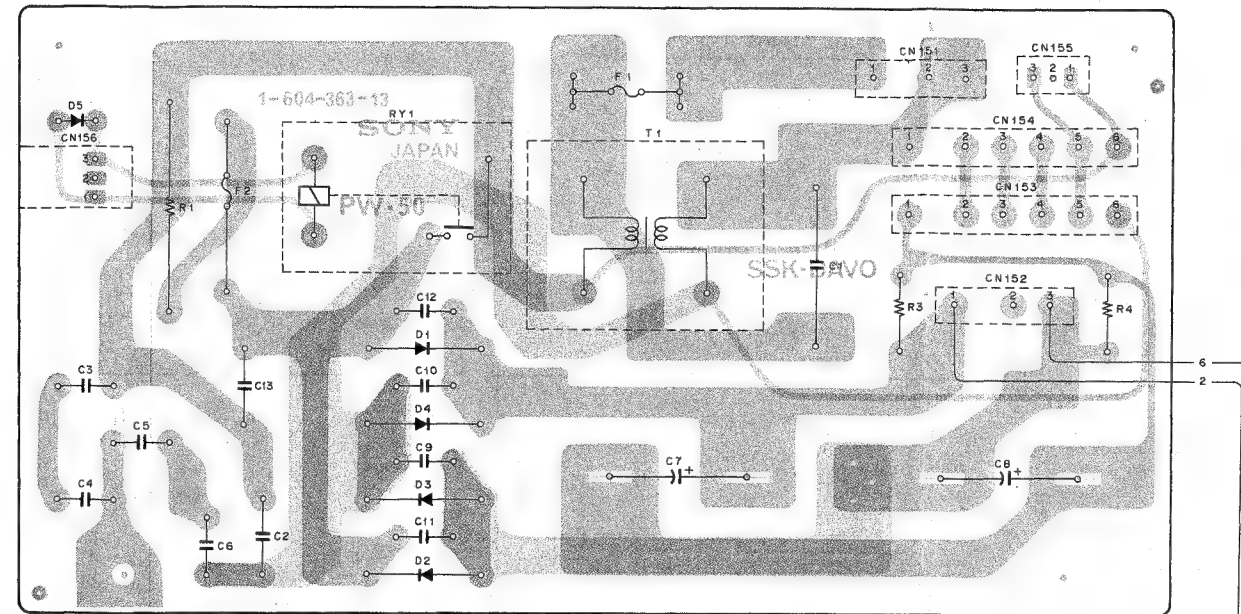
PW-50, RL-14, PW-79, FU-16

PW-50, RL-14 (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-16 (FUSE BOARD)

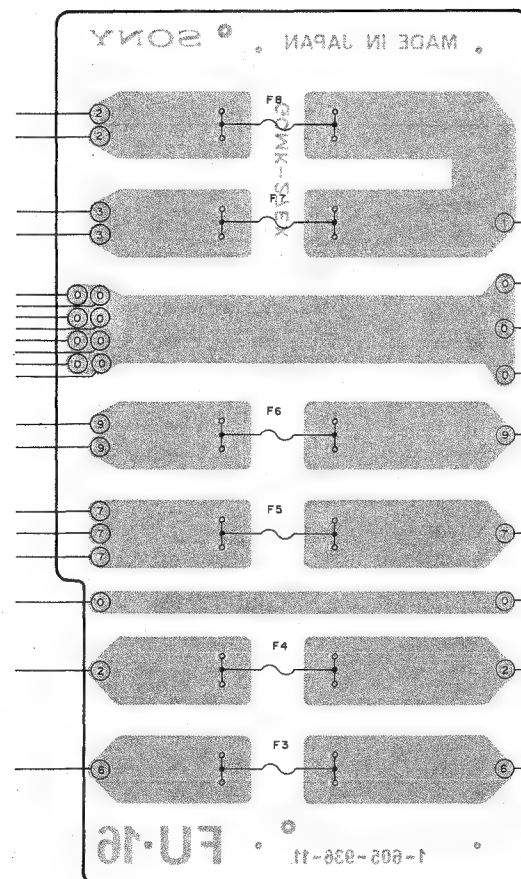
SER. No. Up to 10600 (PAL)  
SER. No. Up to 10050 (SECAM)



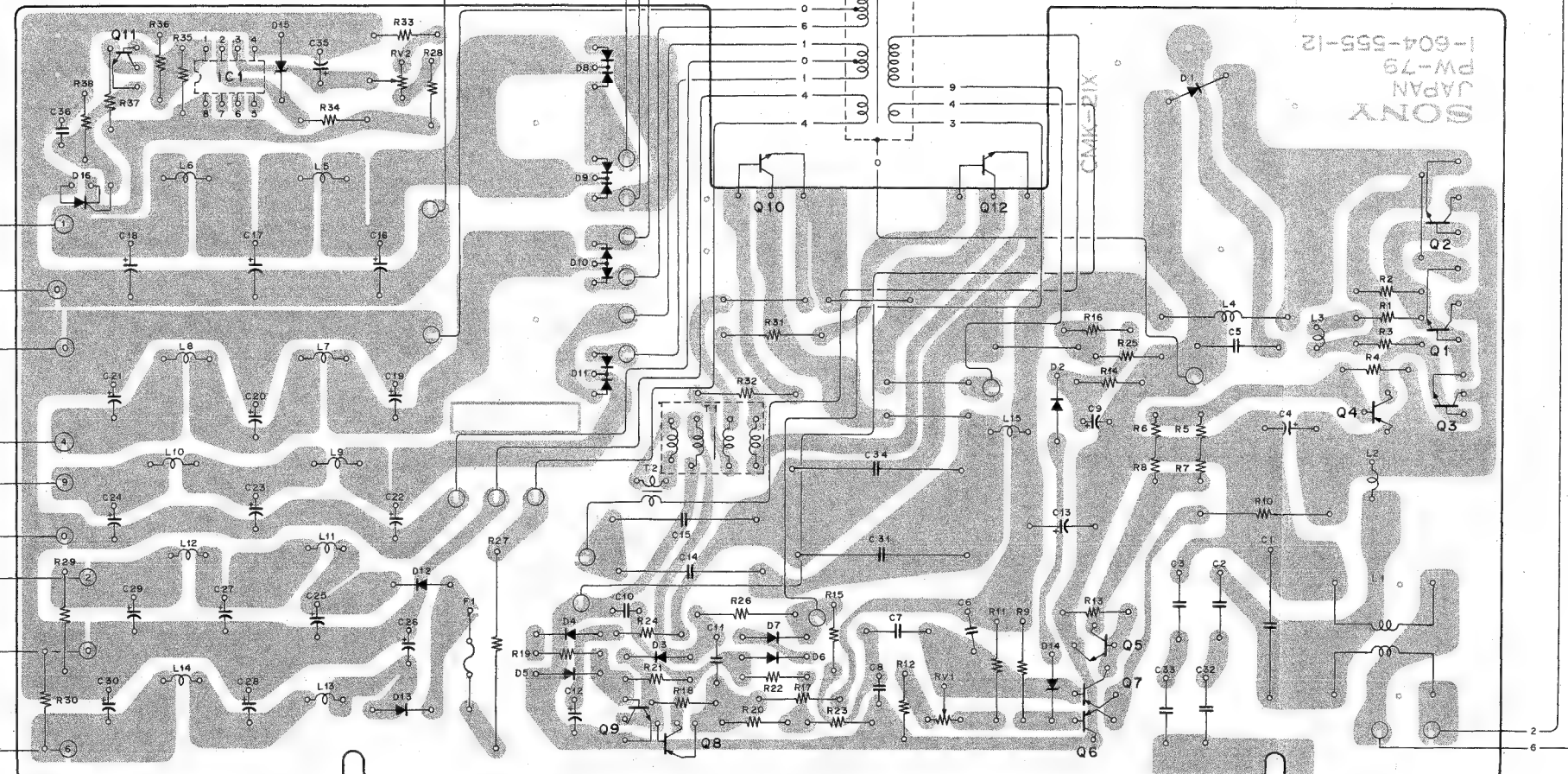
RL-14 - SOLDERING SIDE -  
1-606-043-11



PW-50 - SOLDERING SIDE -  
1-604-363-13,14



FU-16 - COMPONENT SIDE -  
1-605-936-11,12  
BVU-820P (S/N. 10001 ~ 10600)  
BVU-820S (S/N. 10001 ~ 10050)

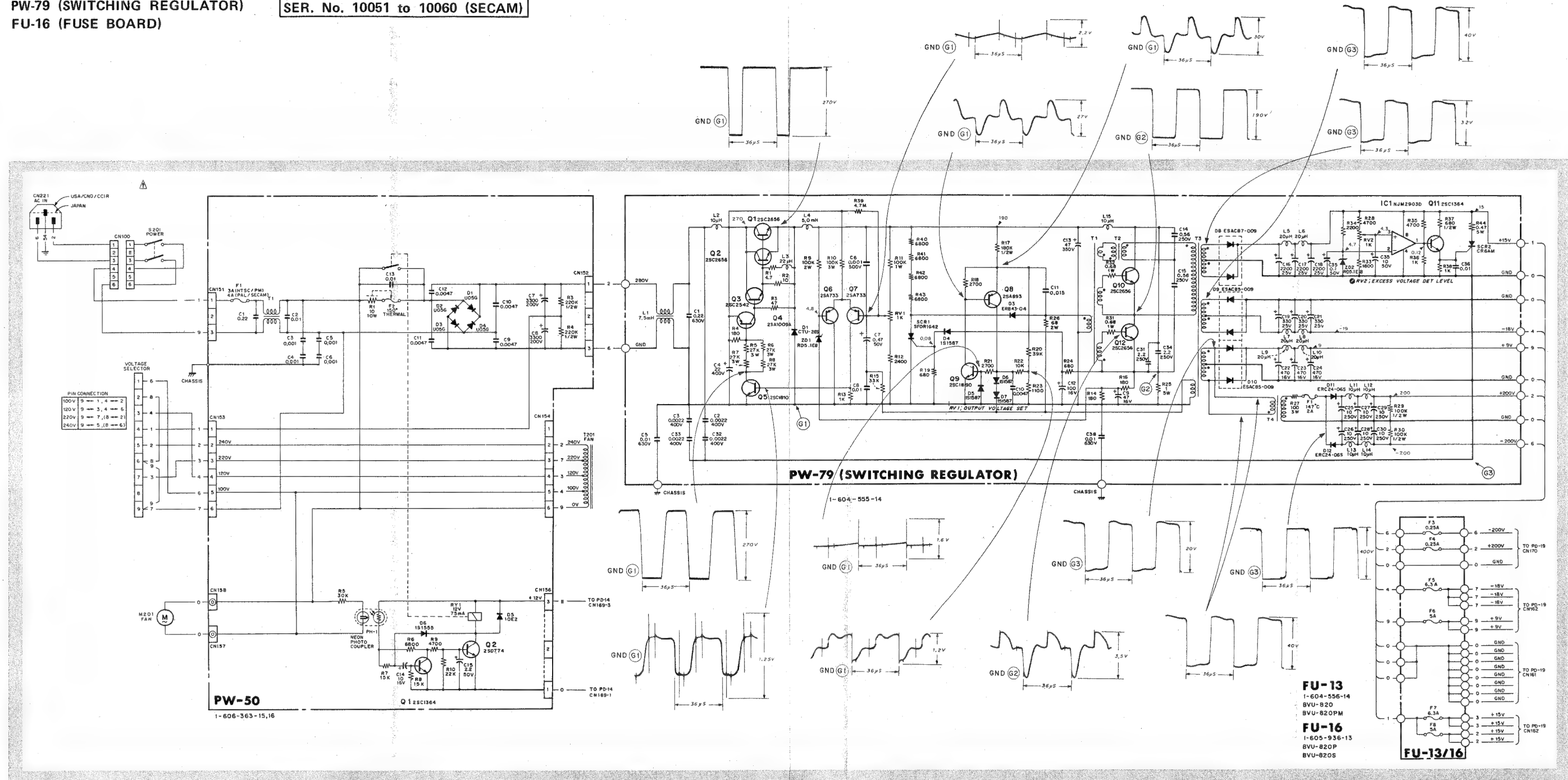


PW-79 - SOLDERING SIDE -  
1-604-555-12,13



PW-50 (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-16 (FUSE BOARD)

SER. No. 10601 to 11230 (PAL)  
SER. No. 10051 to 10060 (SECAM)



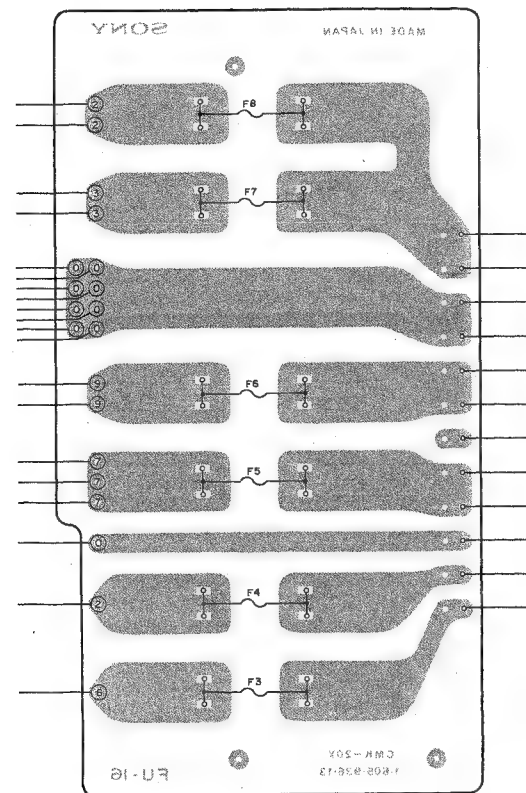


PW-50, PW-79, FU-16

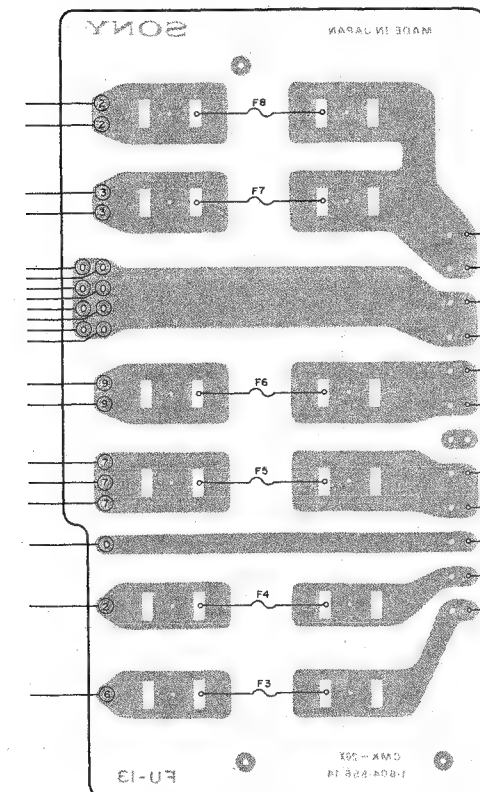
PW-50, PW-79, FU-16

PW-50 (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-16 (FUSE BOARD)

SER. No. 10601 to 11230 (PAL)  
SER. No. 10051 to 10060 (SECAM)

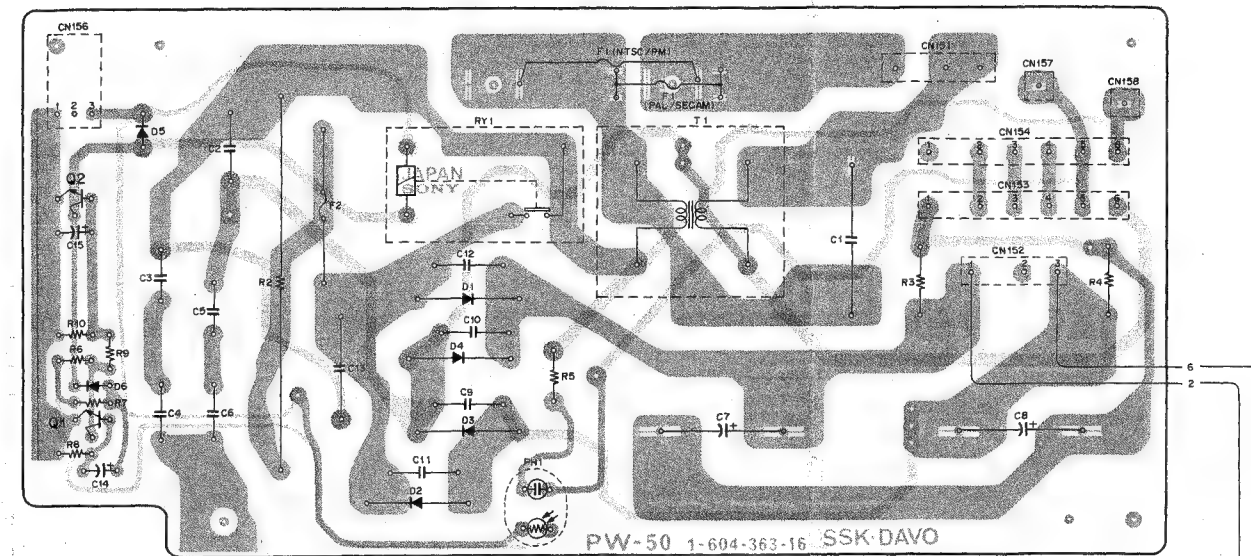


**FU-16 - COMPONENT SIDE -**  
1-605-936-13  
BVU-820P(S/N.10601~11230)  
BVU-820S(S/N.10051~10060)

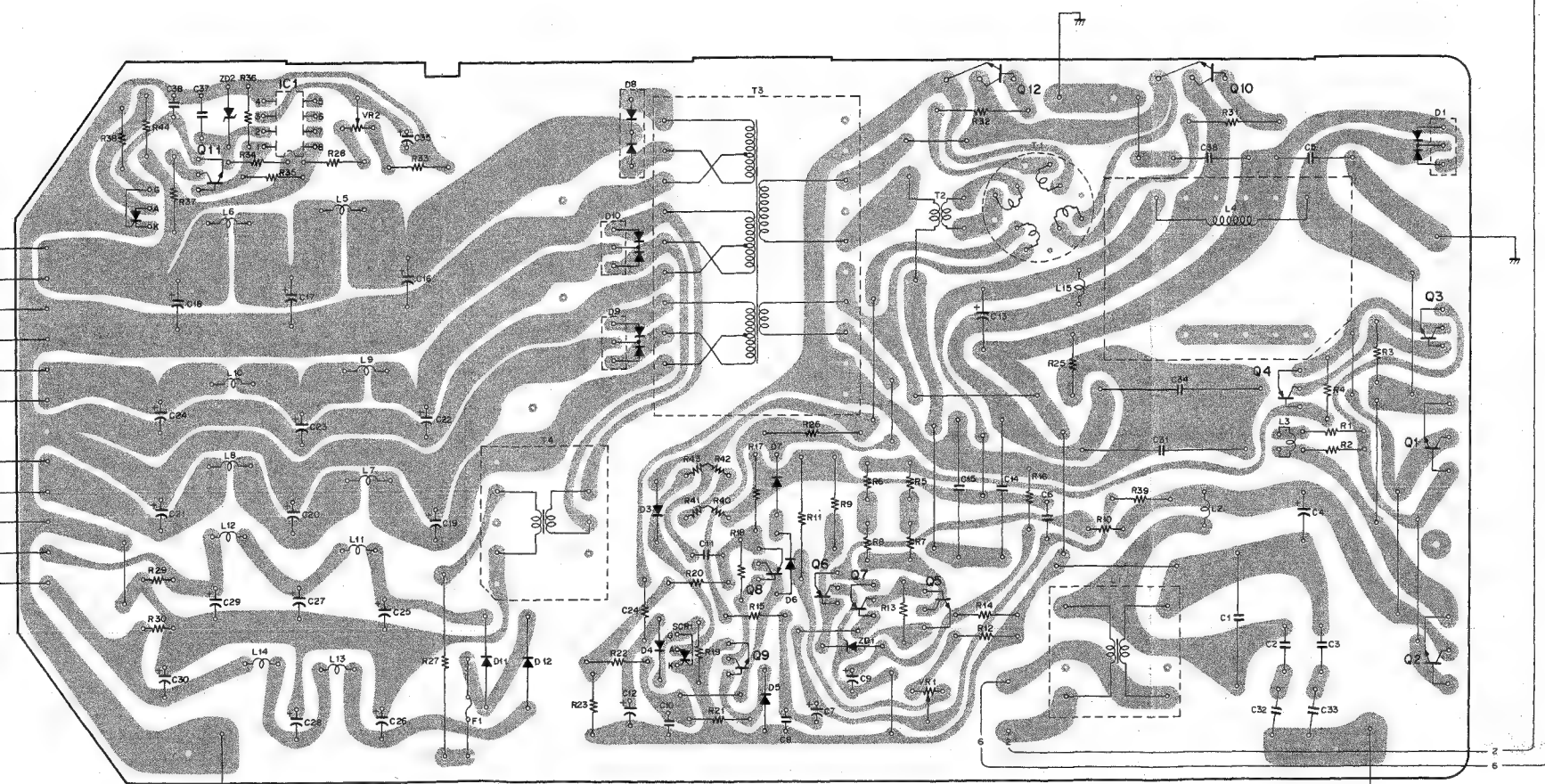


**FU-13 - COMPONENT SIDE -**  
1-604-556-14  
BVU-820 (S/N.10746~11375(U/C))  
(S/N.10251~10440(J))  
BVU-820PM (S/N.10006~10010)

17-85(b)



**PW-50 - SOLDERING SIDE -**  
1-604-363-15,16



**PW-79 - SOLDERING SIDE -**  
1-604-555-14

17-86(b)

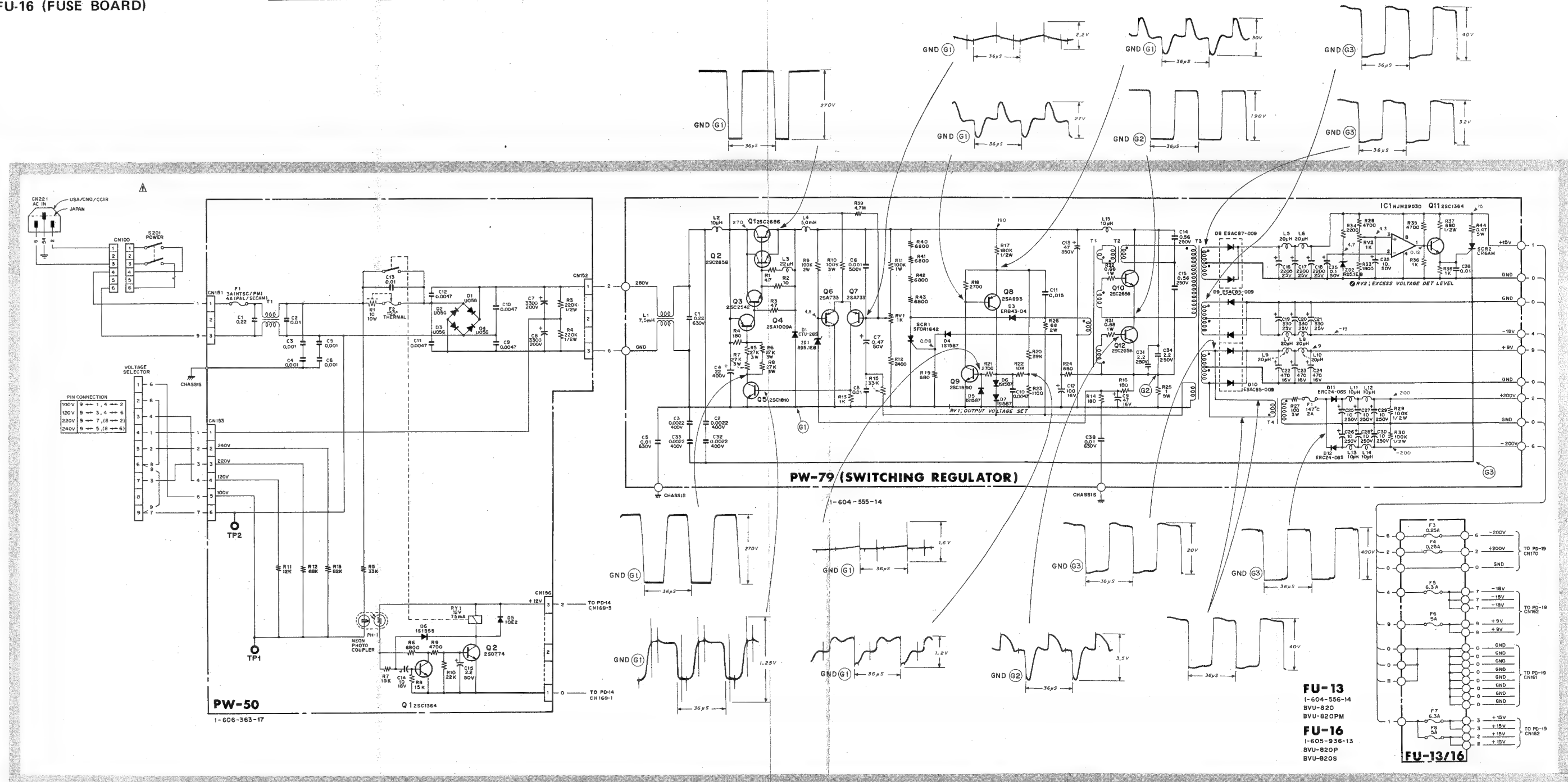


PW-50, PW-79, FU-16

PW-50, PW-79, FU-16

PW-50 (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-16 (FUSE BOARD)

SER. No. 11231 and higher (PAL)  
SER. No. 10061 and higher (SECAM)



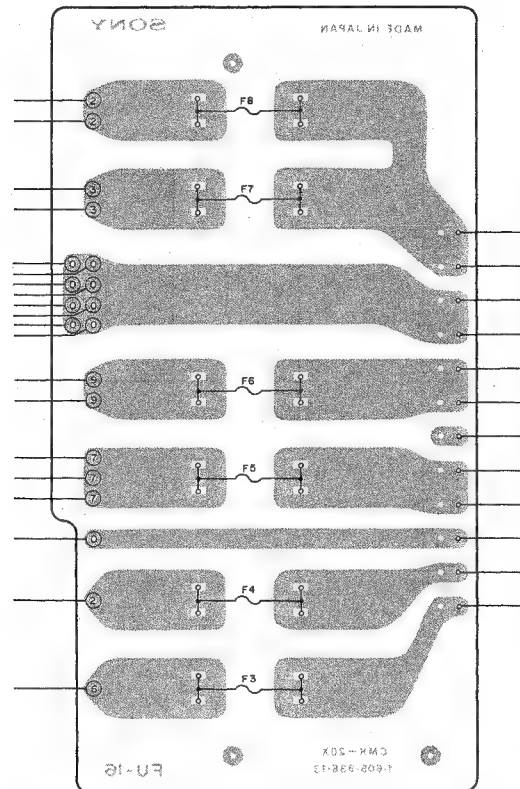


PW-50, PW-79, FU-16

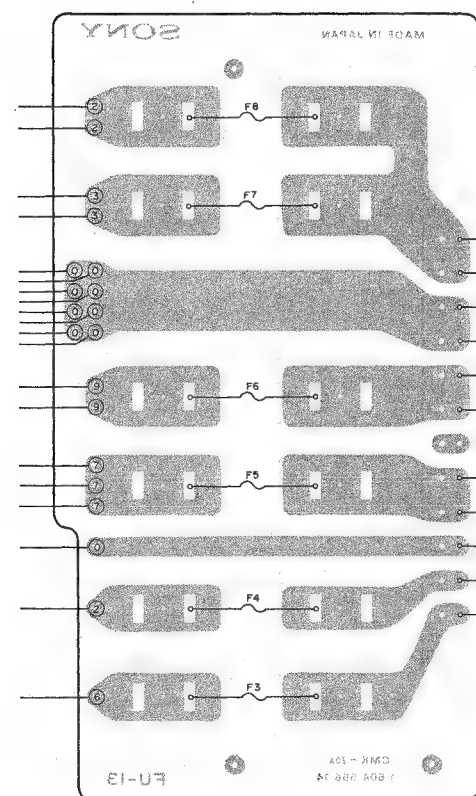
PW-50, PW-79, FU-16

PW-50 (RECTIFIER)  
PW-79 (SWITCHING REGULATOR)  
FU-16 (FUSE BOARD)

SER. No. 11231 and higher (PAL)  
SER. No. 10061 and higher (SECAM)

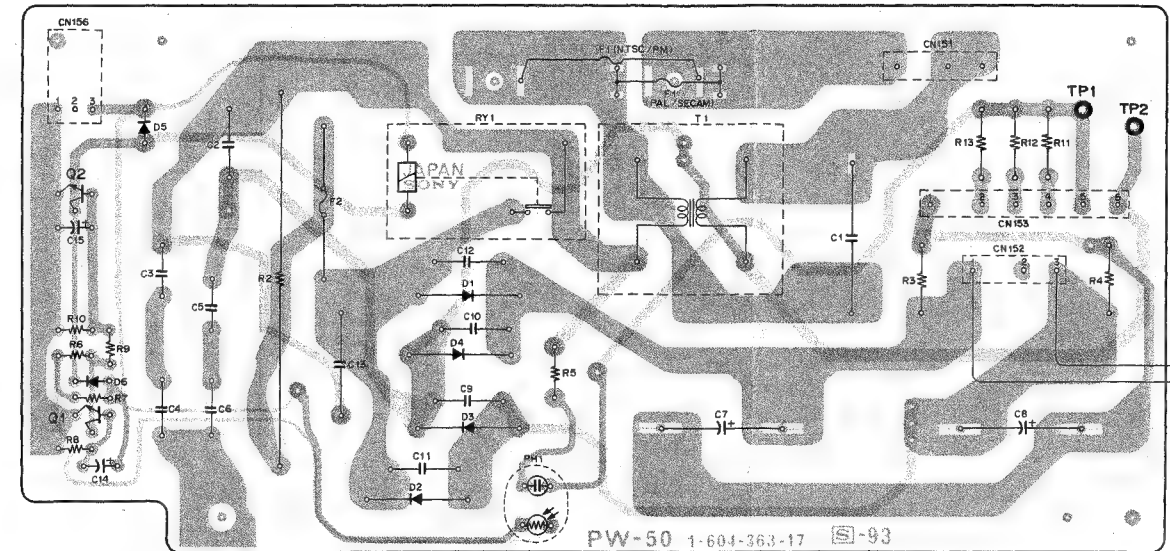


**FU-16** - COMPONENT SIDE -  
1-605-936-13  
BVU-820P(S/N.11231 ~)  
BVU-820S(S/N.10061 ~)

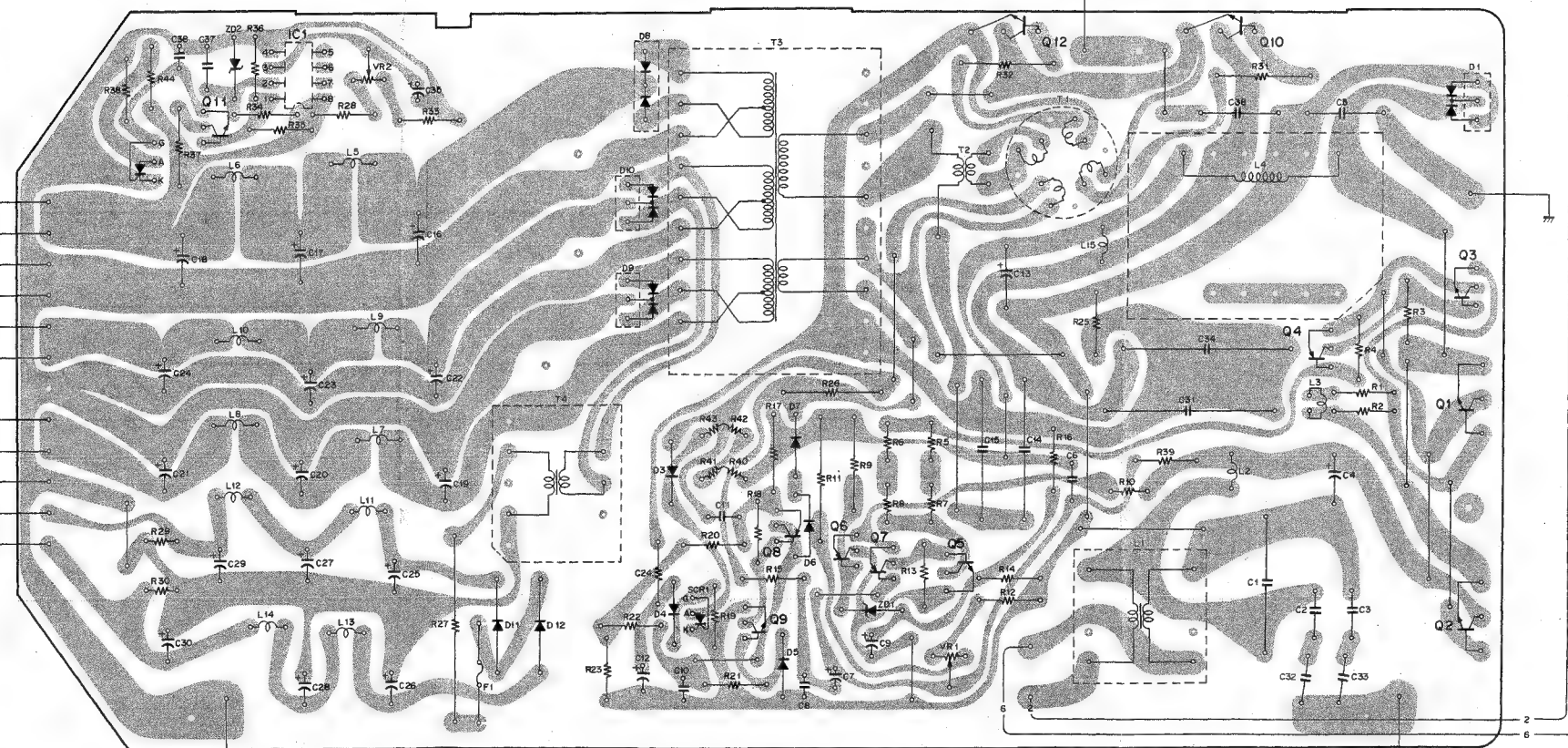


**FU-13** - COMPONENT SIDE -  
1-604-556-14  
BVU-820 (S/N.11376 ~ (U/C))  
(S/N.10441 ~ (J))  
BVU-820PM (S/N.10011 ~)

17-85(c)



**PW-50** - SOLDERING SIDE -  
1-604-363-17



**PW-79** - SOLDERING SIDE -  
1-604-555-14

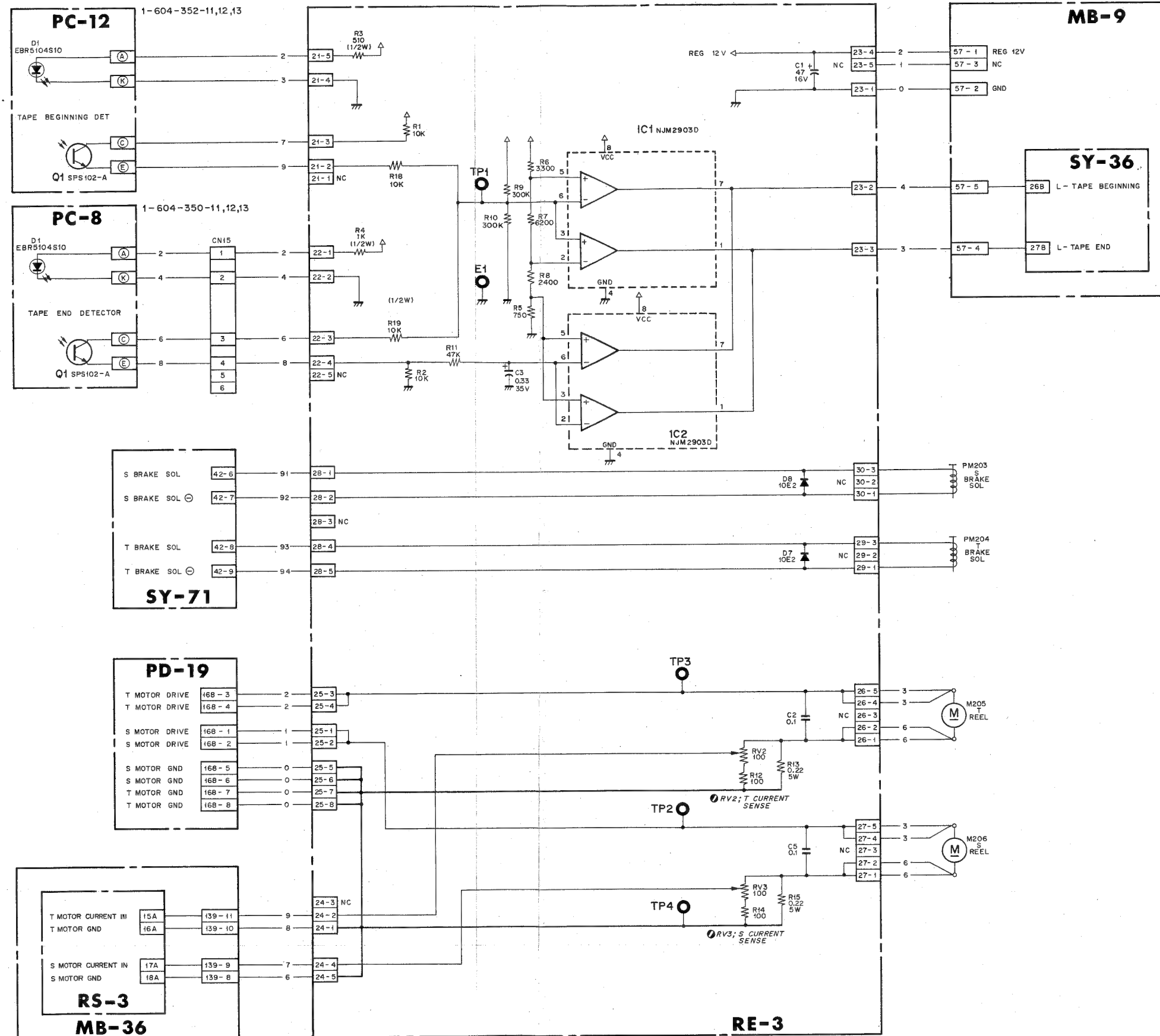
17-86(c)



RE-3, PC-8, PC-12

RE-3, PC-8, PC-12

RE-3 (REEL MOTOR)  
PC-8, PC-12 (TAPE POSITION DETECTOR)



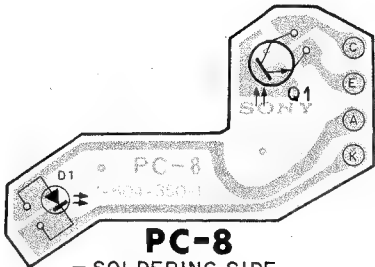


RE-3, PC-8, PC-12

RE-3, PC-8, PC-12

RE-3 (REEL MOTOR)

PC-8, PC-12 (TAPE POSITION DETECTOR)



**PC-8**

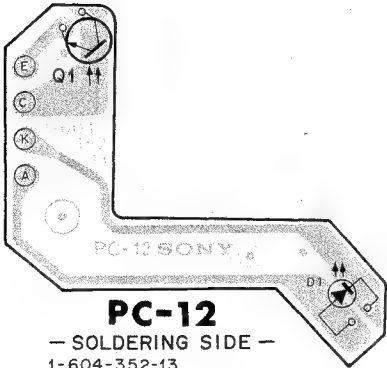
— SOLDERING SIDE —

1-604-350-13

BUU-820

BUU-820P

BUU-820S



**PC-12**

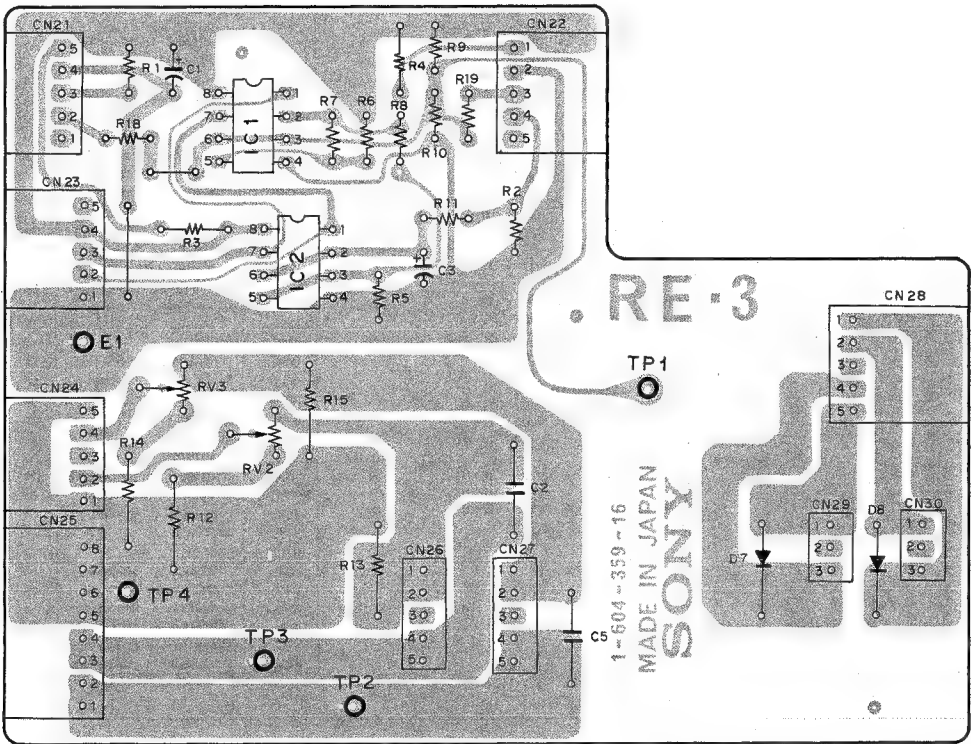
— SOLDERING SIDE —

1-604-352-13

BUU-820

BUU-820P

BUU-820S



**RE-3**—SOLDERING SIDE—

1-604-359-16

BUU-820 (S/N. 10351 ~ (U/C))

(S/N. 10201 ~ (J))

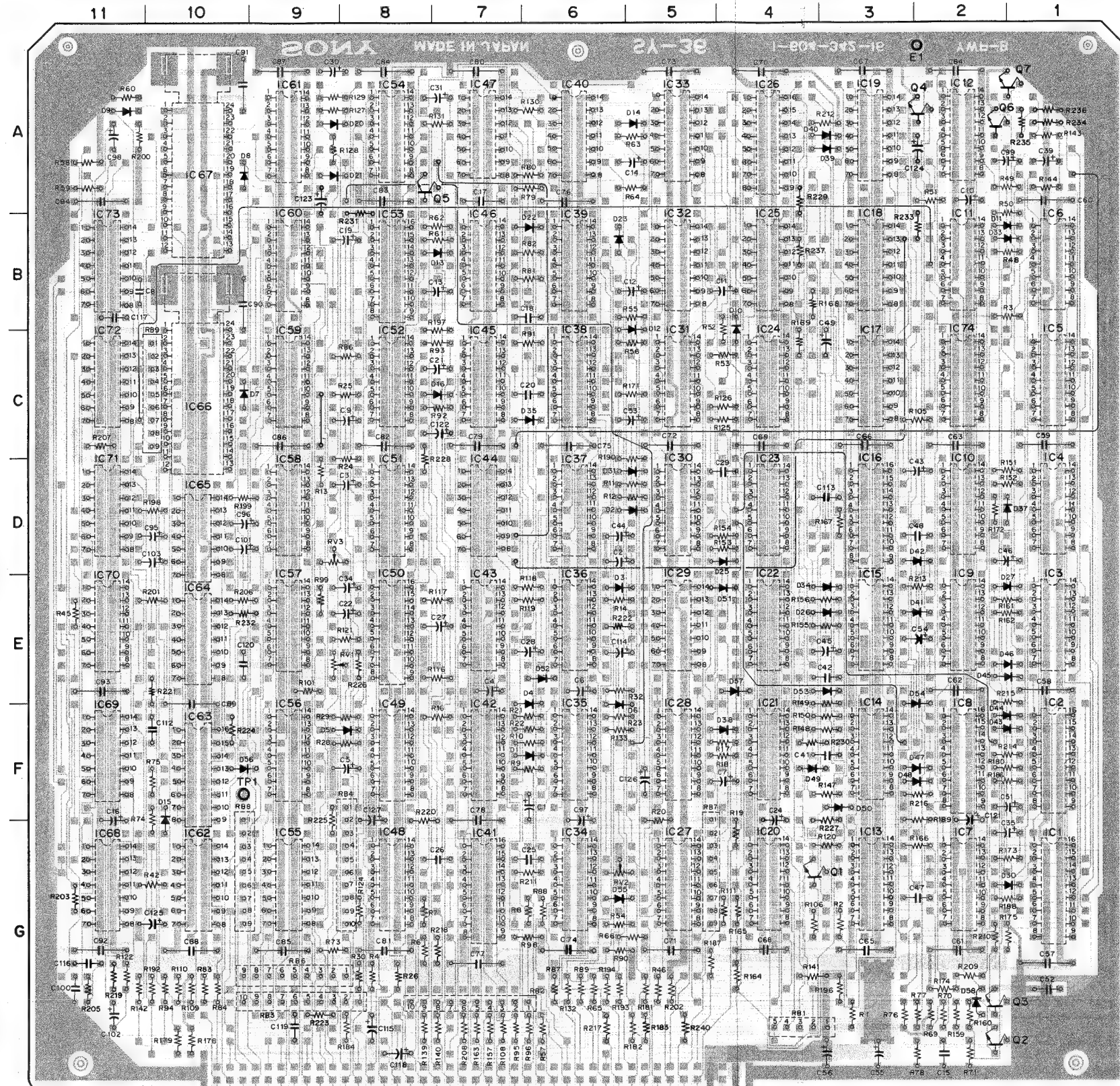
BUU-820P (S/N. 10221 ~ )

BUU-820S (S/N. 10021 ~ )

BUU-820PM (S/N. 10001 ~ )



SY-36-1 (FUNCTION SYSTEM CONTROL)



1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE

D1	F-6	IC24	C-4
D2	D-5	IC25	B-4
D3	E-6	IC26	A-4
D4	F-6	IC27	G-5
D5	F-8	IC28	F-5
D6	E-6	IC29	E-5
D7	C-10	IC30	D-5
D8	A-10	IC31	C-5
D9	A-11	IC32	B-5
D10	C-4	IC33	A-5
D11	B-2	IC34	G-6
D12	C-5	IC35	F-6
D13	B-7	IC36	E-6
D14	A-5	IC37	D-6
D15	F-10	IC38	C-6
D16	C-7	IC39	B-6
D20	A-9	IC40	A-6
D21	A-9	IC41	G-7
D22	B-6	IC42	F-7
D23	B-6	IC43	E-7
D25	D-4	IC44	D-7
D26	E-3	IC45	C-7
D27	E-2	IC46	B-7
D30	G-2	IC47	A-7
D31	D-5	IC48	G-8
D33	B-2	IC49	F-8
D34	D-3	IC50	E-8
D35	C-6	IC51	D-8
D37	D-1	IC52	C-8
D38	F-4	IC53	B-8
D39	A-3	IC54	A-8
D40	A-3	IC55	G-9
D41	E-2	IC56	F-9
D42	D-2	IC57	E-9
D43	F-2	IC58	D-9
D44	F-2	IC59	C-9
D45	E-2	IC60	B-9
D46	E-2	IC61	A-9
D47	F-2	IC62	G-10
D49	F-4	IC63	F-10
D50	F-3	IC64	E-10
D51	E-4	IC65	D-10
D51	D-4	IC66	C-10
D52	E-6	IC67	A-10
D53	E-3	IC68	G-11
D54	E-2	IC69	F-11
D55	G-6	IC70	E-11
D57	E-4	IC71	D-11
D58	G-2	IC72	C-11
E1	A-2	IC73	B-11
IC1	G-1	IC74	C-2
IC2	F-1		
IC3	E-1	Q1	G-4
IC4	D-1	Q2	G-2
IC5	C-1	Q3	G-2
IC6	B-1	Q4	A-2
IC7	G-2	Q5	A-7
IC8	F-2	Q6	A-2
IC9	E-2	Q7	A-1
IC10	D-2		
IC11	B-2	RB1	G-4
IC12	A-2	RB2	G-7
IC13	G-3	RB3	G-9
IC14	F-3	RB4	G-8
IC15	E-3	RB5	G-7
IC16	D-3	RB6	G-9
IC17	C-3	RB7	G-5
IC18	B-3	RB8	G-10
IC19	A-3	RB9	C-10
IC20	G-4		
IC21	F-4	RV1	E-9
IC22	E-4	RV2	G-6
IC23	D-4	RV3	D-9
		TP1	F-10

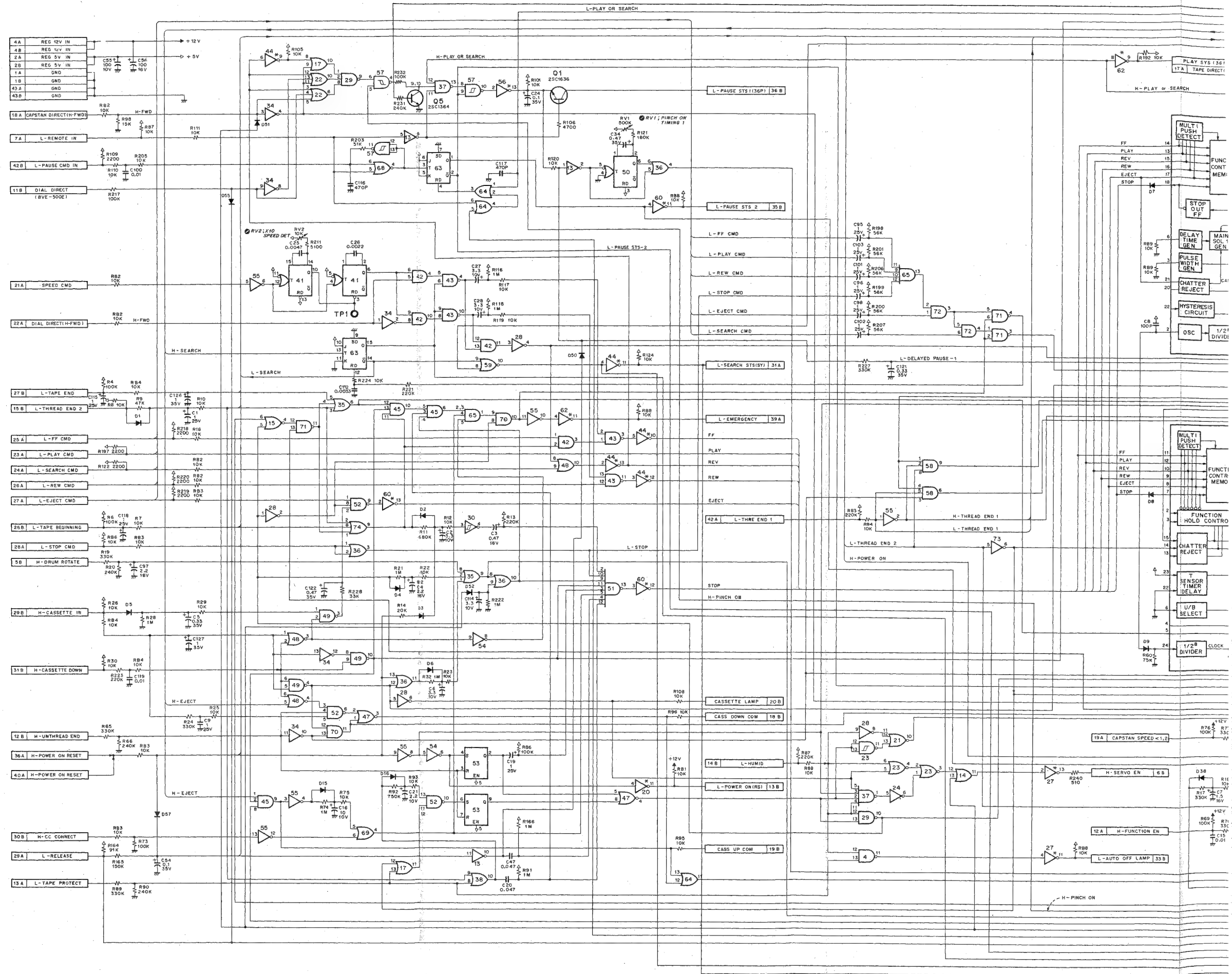
REF. NO.	TYPE	PIN NO.	
		+V (5V)	GND
IC1	TC40161BP	16	8
IC2	TC4512BP	16	8
IC3	TC4081BP	14	7
IC4	TC4011BP	14	7
IC5	TC4073BP	14	7
IC6	TC4075BP	14	7
IC7	TC4081BP	14	7
IC8	TC4512BP	16	8
IC9	TC4081BP	14	7
IC10	TC4069UBP	14	7
IC11	TC4069UBP	14	7
IC12	TC4082BP	14	7
IC13	TC4069UBP	14	7
IC14	TC4071BP	14	7
IC15	TC4001BP	14	7
IC16	TC4043BP	16	8
IC17	TC4071BP	14	7
IC18	TC4071BP	14	7
IC19	TC4073BP	14	7
IC20	M54529P	14	7
IC21	TC4025BP	14	7
IC22	TC4075BP	14	7
IC23	TC4001BP	14	7
IC24	TC4069UBP	14	7
IC25	TC4025BP	14	7
IC26	TC4043BP	16	8
IC27	M54529P	14	7
IC28	TC4069UBP	14	7
IC29	TC4023BP	14	7
IC30	MC14584BCP	14	7
IC31	TC4081BP	14	7
IC32	TC4011BP	14	7
IC33	TC4001BP	14	7
IC34	TC4069UBP	14	7
IC35	TC4075BP	14	7
IC36	TC4071BP	14	7
IC37	TC4012BP	14	7
IC38	TC4071BP	14	7
IC39	TC4072BP	14	7
IC40	TC4073BP	14	7
IC41	TC4528BP	16	8
IC42	TC4081BP	14	7
IC43	TC4011BP	14	7
IC44	M54529P	14	7
IC45	TC4073BP	14	7
IC46	TC4071BP	14	7
IC47	TC4001BP	14	7
IC48	TC4001BP	14	7
IC49	TC4011BP	14	7
IC50	HD14538BP	16	8
IC51	TC4068BP	14	7
IC52	TC4023BP	14	7
IC53	TC4043BP	16	8
IC54	TC4069UBP	14	7
IC55	TC4069UBP	14	7
IC56	M54529P	14	7
IC57	TC4093BP	14	7
IC58	TC4073BP	14	7
IC59	TC4001BP	14	7
IC60	M54529P	14	7
IC61	MC14584BCP	14	7
IC62	M54529P	14	7
IC63	TC4027BP	16	8
IC64	TC4071BP	14	7
IC65	TC4082BP	14	7
IC66	CX755A	F	24
IC67	CX757	F	1
IC68	TC4001BP	14	7
IC69	TC4071BP	14	7
IC70	TC4081BP	14	7
IC71	TC4011BP	14	7
IC72	TC4081BP	14	7
IC73	TC4069UBP	14	7

SY-36-1---COMPONENT SIDE---  
1-604-342-16,17  
BVU-820 (S/N.10151~(U/C))  
BVU-820P (S/N.10041~)  
BVU-820S (S/N.10001~)  
BVU-820PM (S/N.10001~)

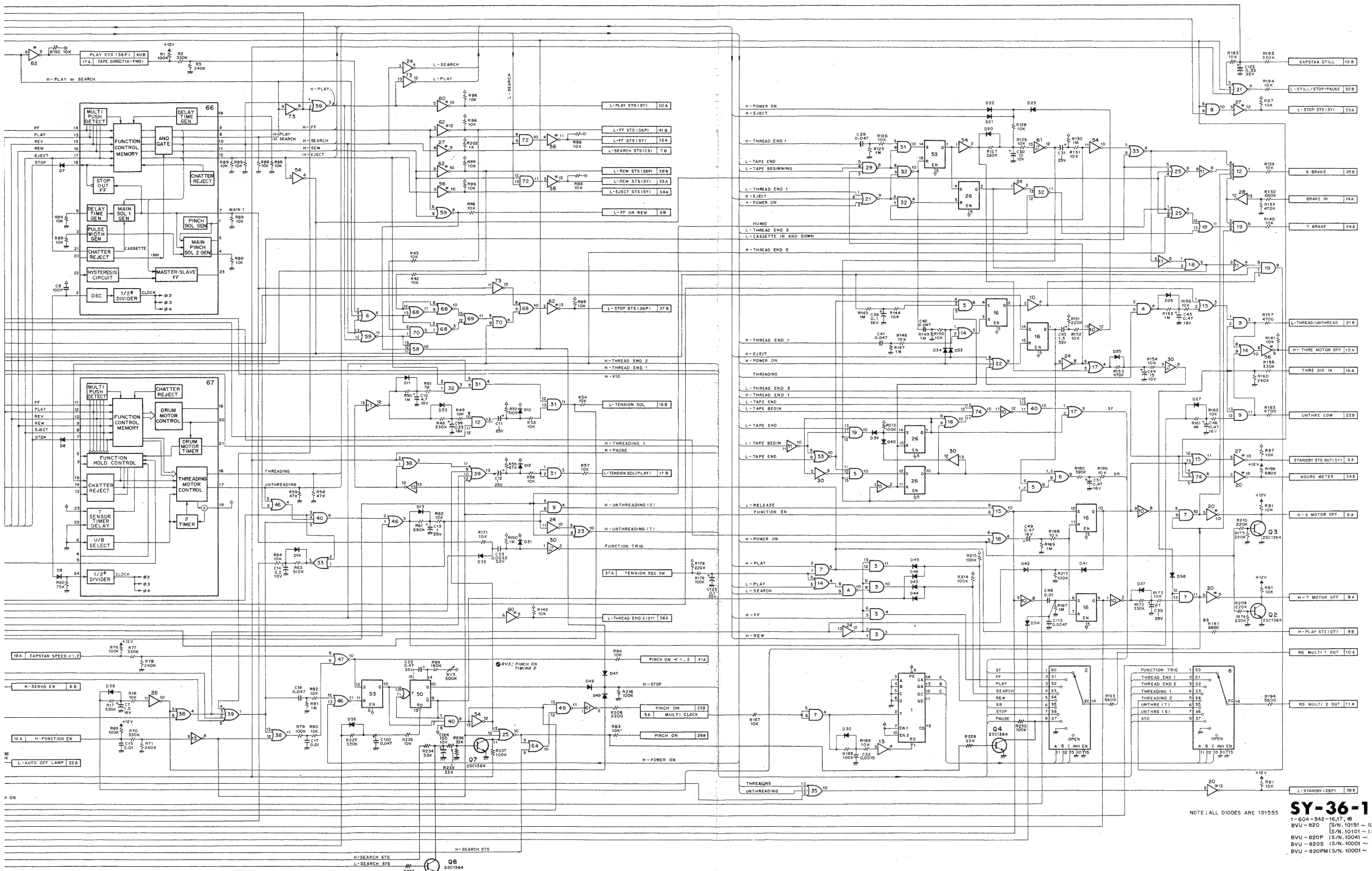


SY-36-1 (FUNCTION SYSTEM CONTROL)

MARK	CHANGE INFORMATION	SERIAL NO.
1	C35 2.2/25V → 1/25V	U/C:10201 ~ J:10201 ~ P:10201 ~ S:10201 ~ PM:10201 ~
2	C4 1/16V → 2.2/16V	U/C:10201 ~ J:10201 ~ P:10201 ~ S:10201 ~ PM:10201 ~
3	R181 10K → 6800	U/C:10201 ~ J:10201 ~ P:10201 ~ S:10201 ~ PM:10201 ~







NOTE: ALL DIODES ARE 1S1555

# SY-36-1

1-604-342-16,17,18  
BVU-820 (S/N.10151 ~ (U/C)  
BVU-820P (S/N.10041 ~ )  
BVU-820S (S/N.10001 ~ )  
BVU-820PM (S/N.10001 ~ )

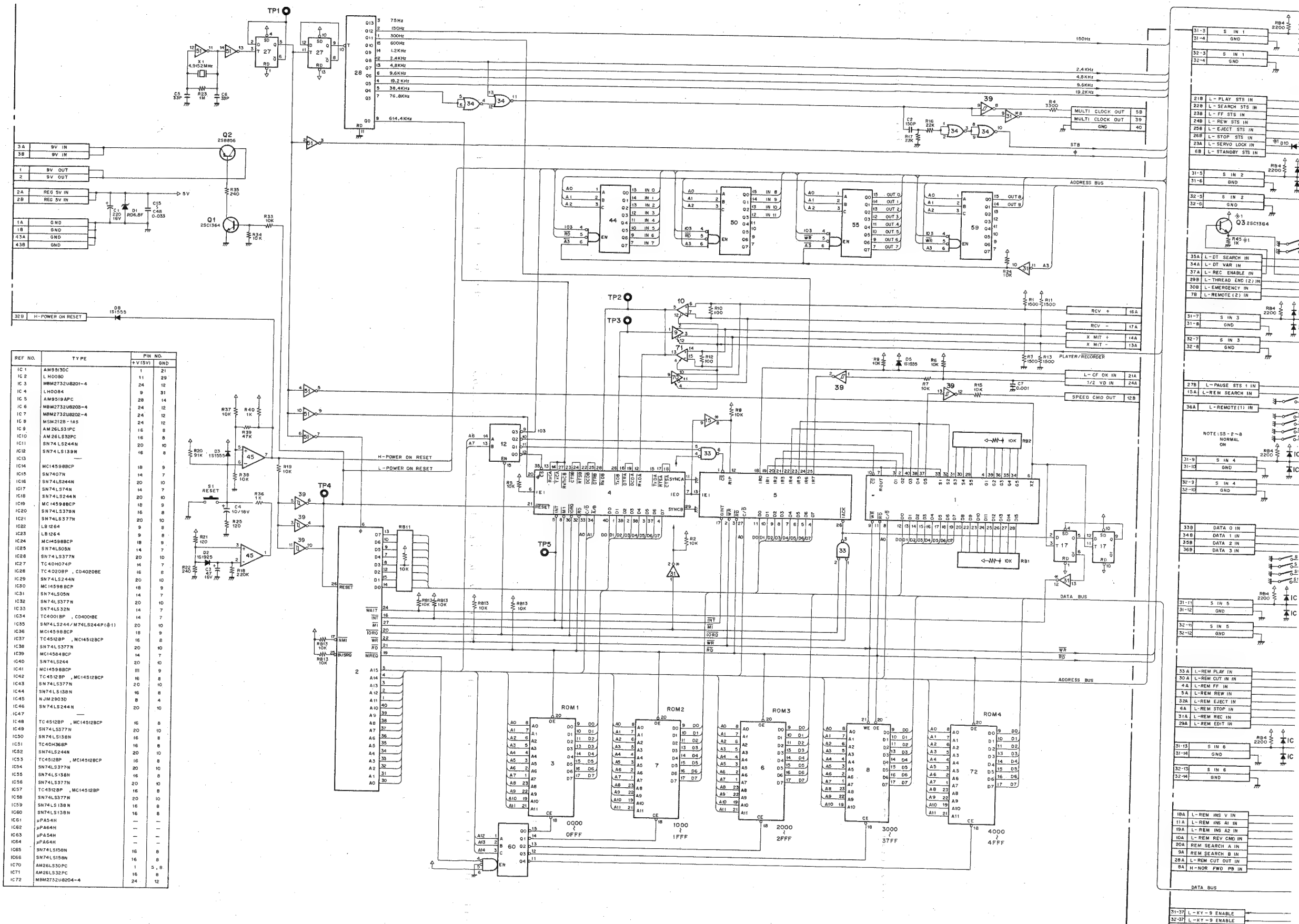


## S. 37-1 (MICRO PROCESSOR)

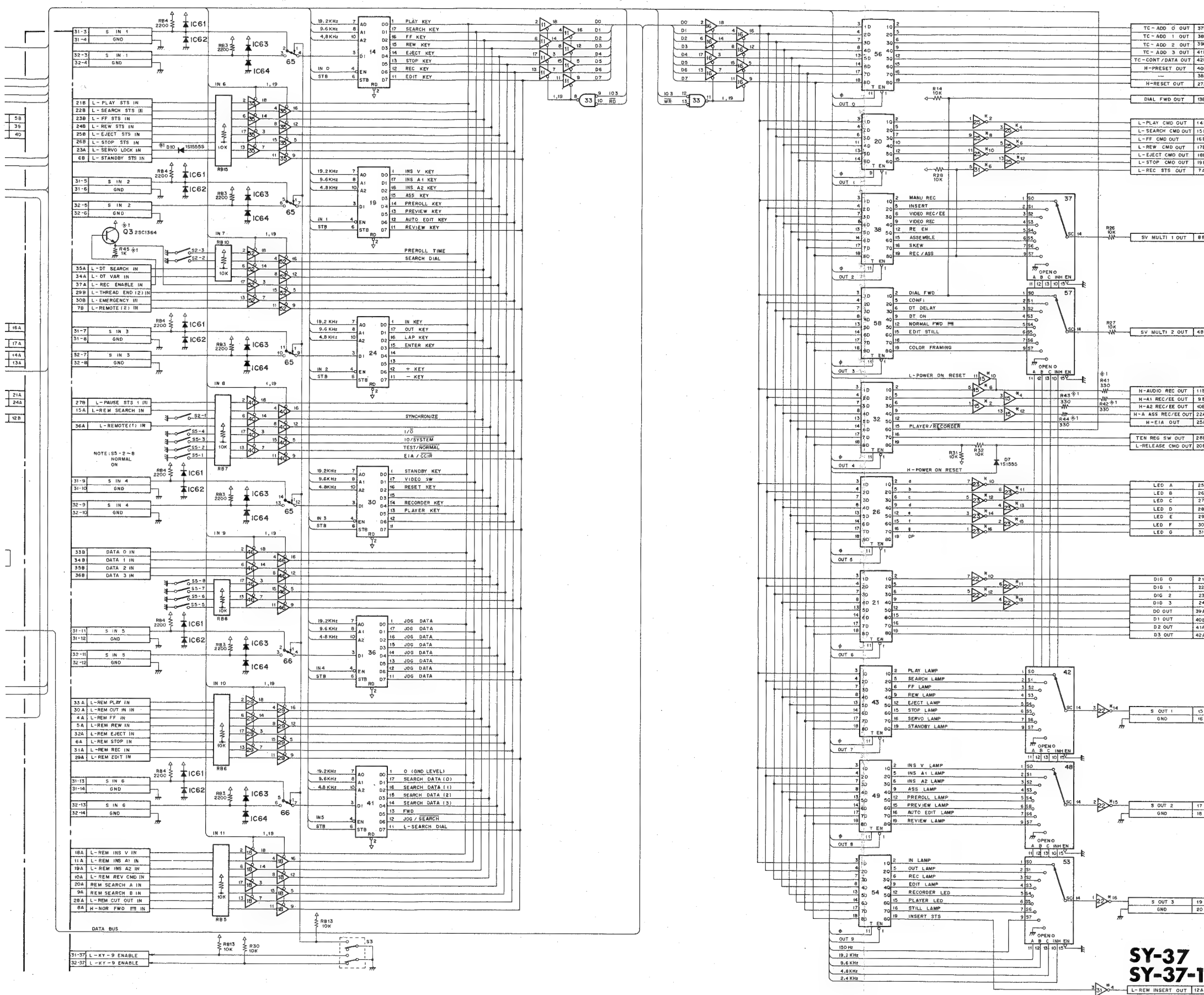
Serial No. UP TO 11615 (PAL)  
Serial No. UP TO 10105 (SECAM)

## NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
①	ADDED - R41, R42, R43, R44 (330Ω) - Q3 (2SC1364) - R45 (1K)	10101~(U/C) 10051~(J) 10081~(P) 10001~(S) 10001~(PM)
	ADDED: D10 (181555)	10021~(0250 (P)) 10021~(0050 (S))
	SHORTED: D10 (NOT IN USE, WHEN MOUNTED) M74LS244P (IC35) CHANGED: IC35 SN74LS244→M74LS244P	10031~(U/C) 10201~(J) 10031~(P) 10051~(S) 10001~(PM)
	ROMS VERSION CHANGE (IC3, 6, 7, 72)	11296~(U/C) 10421~(J) 10991~(P) 10051~(S) 10011~(PM)







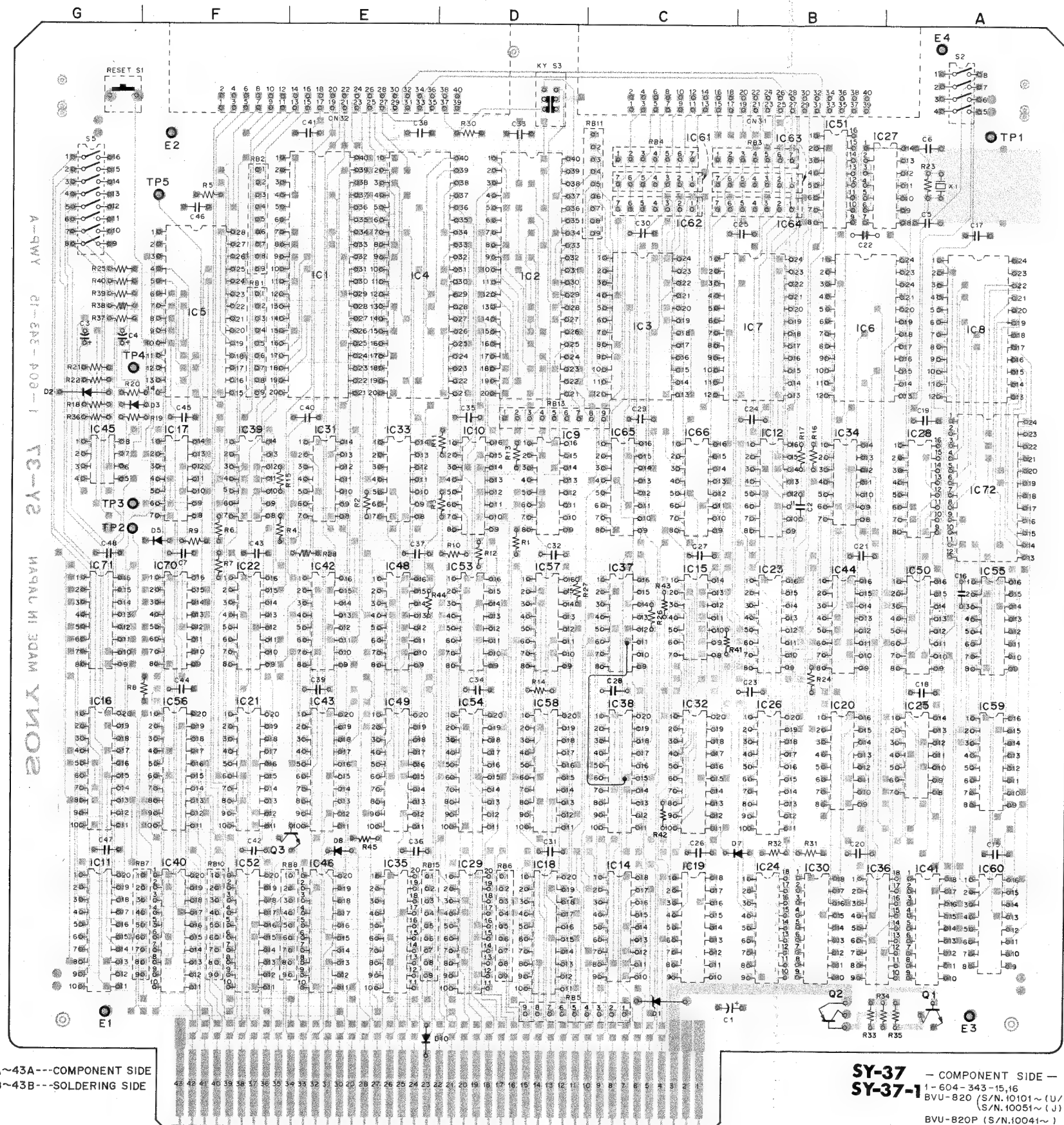
**SY-37**  
**SY-37-1**

1-604-343-13,14,15,16  
BVU-B20P  
BVU-B20S  
BVU-B20PM



SY-37-1 (MICRO PROCESSOR)

Serial No. UP TO 11615 (PAL)  
Serial No. UP TO 10105 (SECAM)



CN31 B-1  
CN32 E-1

D1 C-6  
D2 G-2  
D3 G-2  
D5 F-3  
D6 D-6  
D7 B-6  
D8 E-6  
D10 E-6

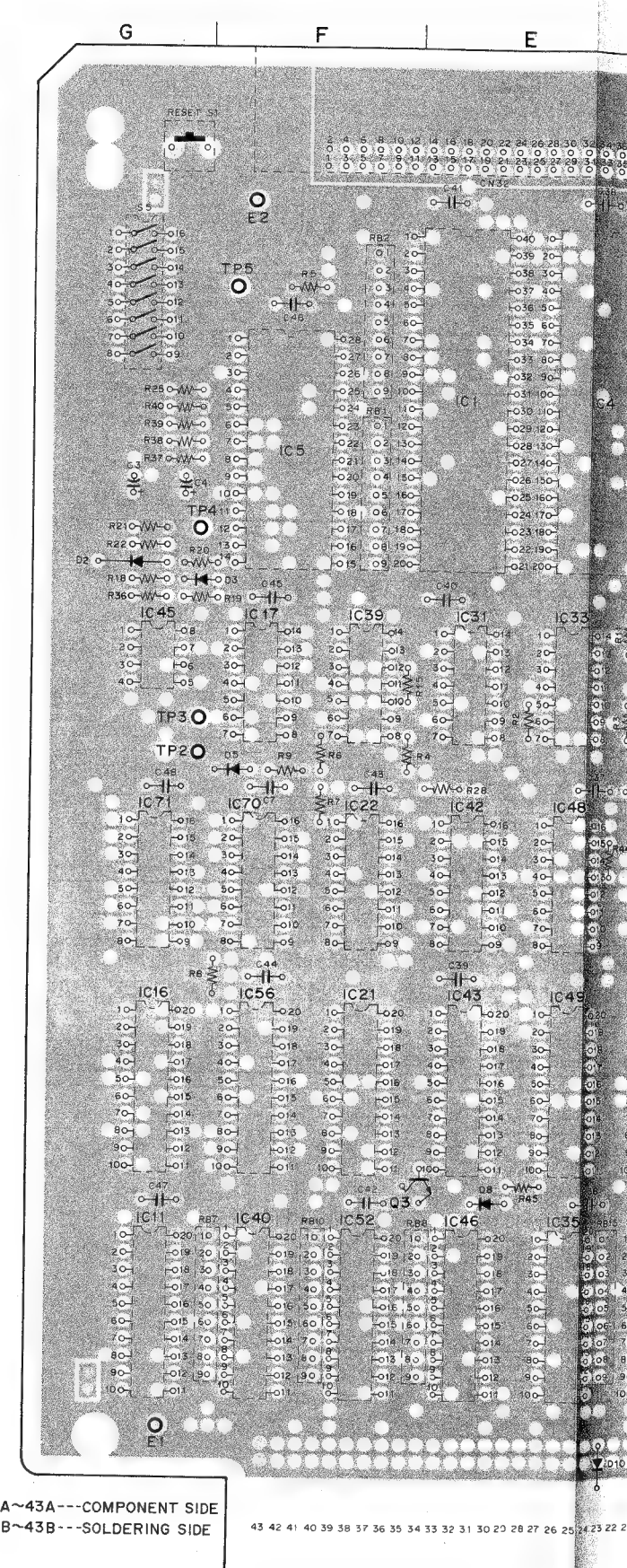
E1 G-6  
E2 F-1  
E3 A-6  
E4 A-1

IC1 E-2  
IC2 D-2  
IC3 C-2  
IC4 E-2  
IC5 F-2  
IC6 B-2  
IC7 B-2  
IC8 A-2  
IC9 D-3  
IC10 D-3  
IC11 G-6  
IC12 B-3  
IC13 A-6  
IC14 C-6  
IC15 C-4  
IC16 G-5  
IC17 F-3  
IC18 D-6  
IC19 C-6  
IC20 B-5  
IC21 F-5  
IC22 F-4  
IC23 B-4  
IC24 B-6  
IC25 A-5  
IC26 B-5  
IC27 B-1  
IC28 A-3  
IC29 D-6  
IC30 B-6  
IC31 E-3  
IC32 C-5  
IC33 E-3  
IC34 B-3  
IC35 E-6  
IC36 B-6  
IC37 C-4  
IC38 C-5  
IC39 F-3  
IC40 F-6  
IC41 A-6  
IC42 E-4  
IC43 E-5  
IC44 B-4  
IC45 G-3  
IC46 E-6  
IC47 E-4  
IC48 E-4  
IC49 A-5  
IC50 A-4  
IC51 B-1  
IC52 F-6  
IC53 D-4  
IC54 D-5  
IC55 A-4  
IC56 F-5  
IC57 D-4  
IC58 D-5  
IC59 A-5  
IC60 A-6  
IC61 C-1  
IC62 C-1  
IC63 B-1  
IC64 B-1  
IC65 C-3  
IC66 C-3  
IC67 F-4  
IC71 G-4  
IC72 A-3

RB1 F-2  
RB2 F-1  
RB3 B-1  
RB4 C-1  
RB5 D-6  
RB6 D-6  
RB7 F-6  
RB8 E-6  
RB10 F-6  
RB11 C-1  
RB13 D-3  
RB15 E-6

S1 G-1  
S2 A-1  
S3 D-1  
S5 G-1

TP1 A-1  
TP2 G-3  
TP3 G-3  
TP4 G-2  
TP5 F-1  
X1 A-1



CN31 B-1  
CN32 E-1

D1 C-6  
D2 G-2  
D3 G-2  
D5 F-3  
D6 D-6  
D7 B-6  
D8 E-6  
D10 E-6

E1 G-6  
E2 F-1  
E3 A-6  
E4 A-1

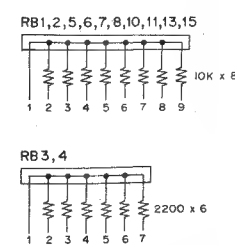
IC1 E-2  
IC2 D-2  
IC3 C-2  
IC4 E-2  
IC5 F-2  
IC6 B-2  
IC7 B-2  
IC8 A-2  
IC9 D-3  
IC10 D-3  
IC11 G-6  
IC12 B-3  
IC13 A-6  
IC14 C-6  
IC15 C-4  
IC16 G-5  
IC17 F-3  
IC18 D-6  
IC19 C-6  
IC20 B-5  
IC21 F-5  
IC22 F-4  
IC23 B-4  
IC24 B-6  
IC25 A-5  
IC26 B-5  
IC27 B-1  
IC28 A-3  
IC29 D-6  
IC30 B-6  
IC31 E-3  
IC32 C-5  
IC33 E-3  
IC34 B-3  
IC35 E-6  
IC36 B-6  
IC37 C-4  
IC38 C-5  
IC39 F-3  
IC40 F-6  
IC41 A-6  
IC42 E-4  
IC43 E-5  
IC44 B-4  
IC45 G-3  
IC46 E-6  
IC47 E-4  
IC48 E-4  
IC49 A-5  
IC50 A-4  
IC51 B-1  
IC52 F-6  
IC53 D-4  
IC54 D-5  
IC55 A-4  
IC56 F-5  
IC57 D-4  
IC58 D-5  
IC59 A-5  
IC60 A-6  
IC61 C-1  
IC62 C-1  
IC63 B-1  
IC64 B-1  
IC65 C-3  
IC66 C-3  
IC67 F-4  
IC71 G-4  
IC72 A-3

RB1 F-2  
RB2 F-1  
RB3 B-1  
RB4 C-1  
RB5 D-6  
RB6 D-6  
RB7 F-6  
RB8 E-6  
RB10 F-6  
RB11 C-1  
RB13 D-3  
RB15 E-6

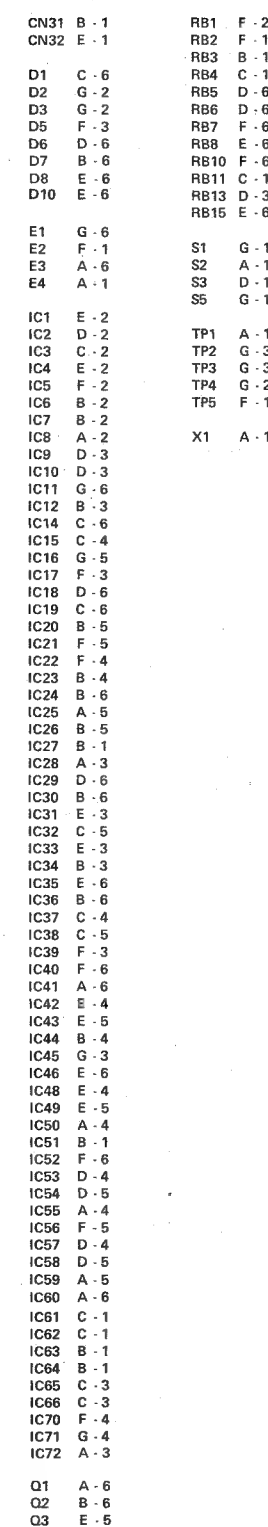
S1 G-1  
S2 A-1  
S3 D-1  
S5 G-1

TP1 A-1  
TP2 G-3  
TP3 G-3  
TP4 G-2  
TP5 F-1  
X1 A-1





17-102 (a)



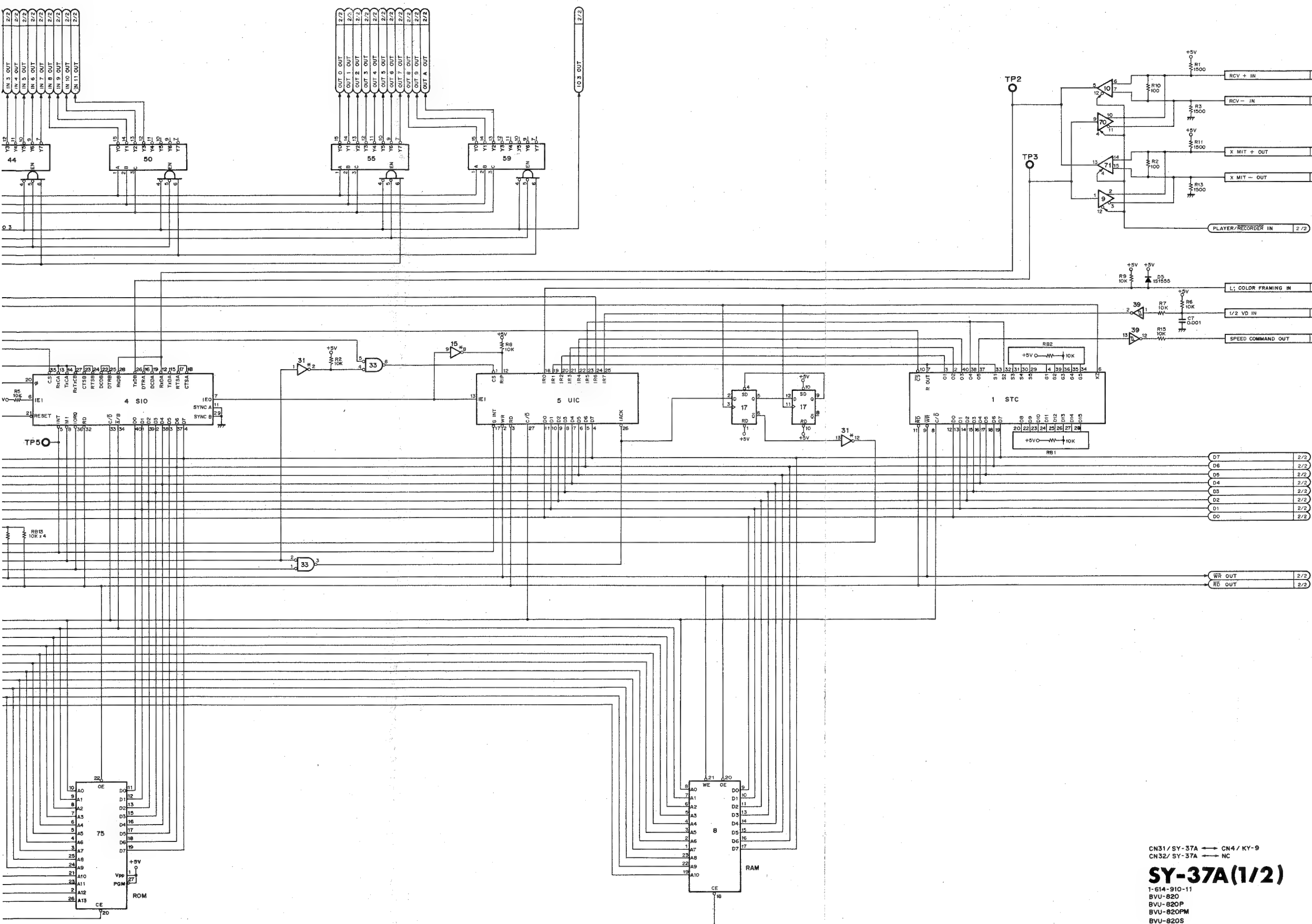
43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 ■ 7 6 5 4 3 2

17-103(a)









REF. NO.	TYPE	PIN NO.
IC 1	AM9513DC	1 21
IC 2	LH0080	11 29
IC 3	---	24 12
IC 4	LH0084	9 31
IC 5	AM9519APC	28 14
IC 6	---	24 12
IC 7	---	24 12
IC 8	MSM2128-15RS	24 12
IC 9	AM26LS31PC	16 8
IC 10	AM26LS32PC	16 8
IC 11	SN74LS244N	20 10
IC 12	SN74LS139N	16 8
IC 13	---	18 9
IC 14	MC14598BCP	14 7
IC 15	SN7407N	20 10
IC 16	SN74LS244N	14 7
IC 17	SN74LS74N	20 10
IC 18	SN74LS244N	18 9
IC 19	MC14598BCP	16 8
IC 20	SN74LS378N	20 10
IC 21	SN74LS377N	9 8
IC 22	LB1261	18 9
IC 23	MC14598BCP	14 7
IC 24	SN74LS05N	20 10
IC 25	SN74LS377N	14 7
IC 26	TC40H074P	16 8
IC 27	TC4020BP	20 10
IC 28	SN74LS244N	16 8
IC 29	MC14598BCP	14 7
IC 30	SN74LS05N	20 10
IC 31	SN74LS377N	14 7
IC 32	SN74LS32N	20 10
IC 33	SN74LS32N	14 7
IC 34	TC4001BP	20 10
IC 35	SN74LS244P	18 9
IC 36	MC14598BCP	16 8
IC 37	TC4512BP	20 10
IC 38	SN74LS377N	14 7
IC 39	MC14598BCP	20 10
IC 40	SN74LS244N	18 9
IC 41	MC14598BCP	16 8
IC 42	TC4512BP	20 10
IC 43	SN74LS377N	16 8
IC 44	SN74LS138N	20 10
IC 45	NJM2903D	8 4
IC 46	SN74LS244N	20 10
IC 47	TC4512BP	16 8
IC 48	SN74LS377N	20 10
IC 49	SN74LS138N	16 8
IC 50	SN74LS138N	20 10
IC 51	TC40H074P	16 8
IC 52	SN74LS244N	20 10
IC 53	TC4512BP	16 8
IC 54	SN74LS377N	20 10
IC 55	SN74LS138N	16 8
IC 56	SN74LS377N	20 10
IC 57	TC4512BP	16 8
IC 58	SN74LS377N	20 10
IC 59	SN74LS138N	16 8
IC 60	pPA54H	16 8
IC 61	pPA64H	16 8
IC 62	pPA64H	16 8
IC 63	pPA54H	16 8
IC 64	pPA64H	16 8
IC 65	SN74LS158N	16 8
IC 66	SN74LS158N	16 8
IC 67	AM26LS31PC	1 5, 8
IC 68	AM26LS32PC	16 8
IC 69	---	24 12
IC 70	SN74HC74N	14 7
IC 71	SN74LS139N	18 9
IC 72	---	28 14

## NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
1	D2	12124 ~ (U/C)
	151925 → 15597-1	10631 ~ (J1)
		11691 ~ (PAL)
		10116 ~ (SECAM)
		10081 ~ (PM)

CN31/SY-37A → CN4/KY-9  
CN32/SY-37A → NC

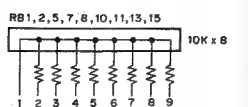
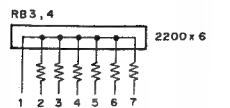
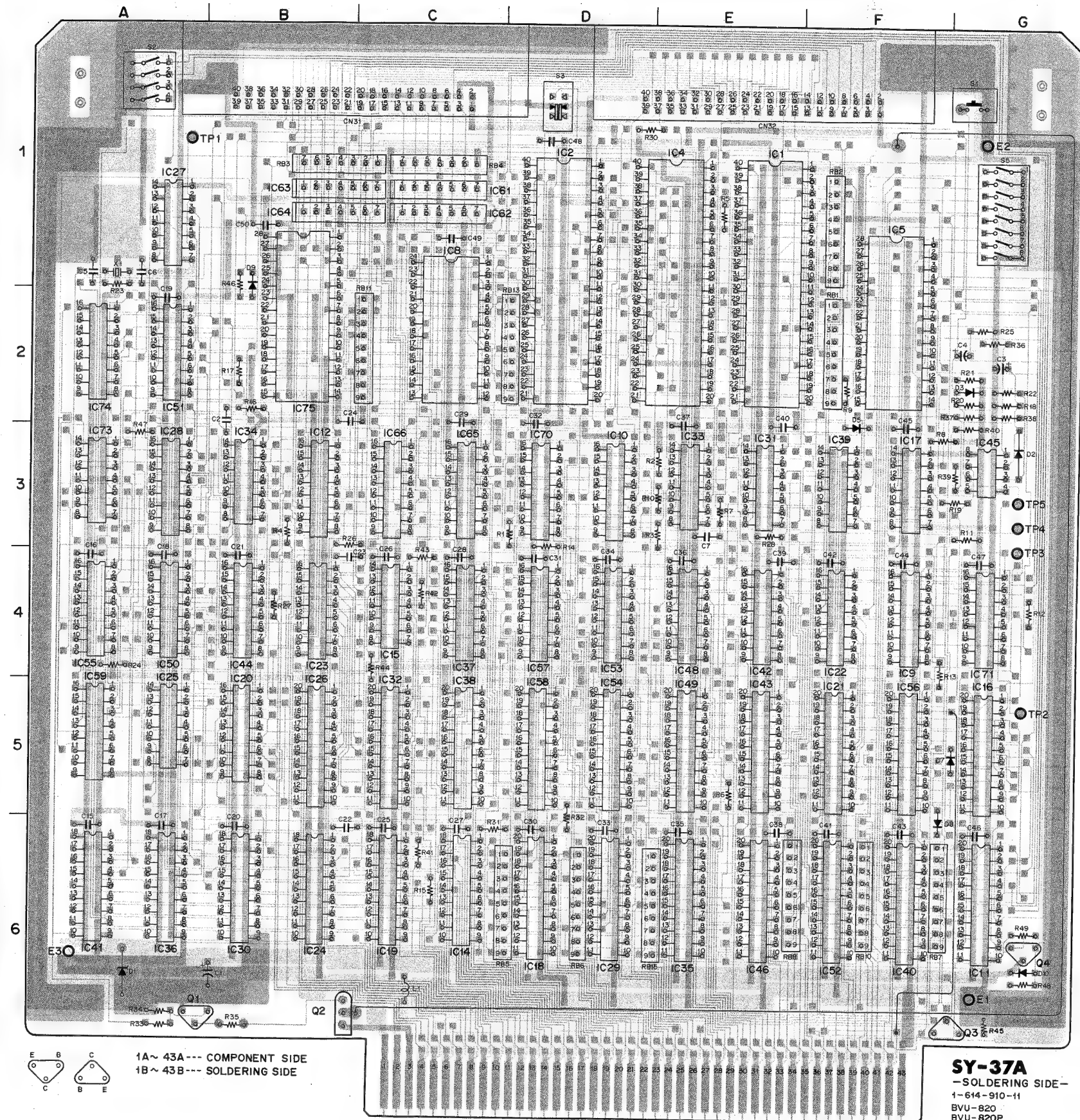
**SY-37A(1/2)**

1-614-910-11  
BVU-820  
BVU-820P  
BVU-820PM  
BVU-820S

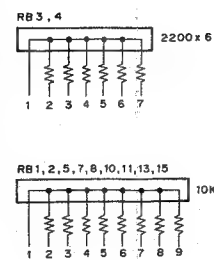
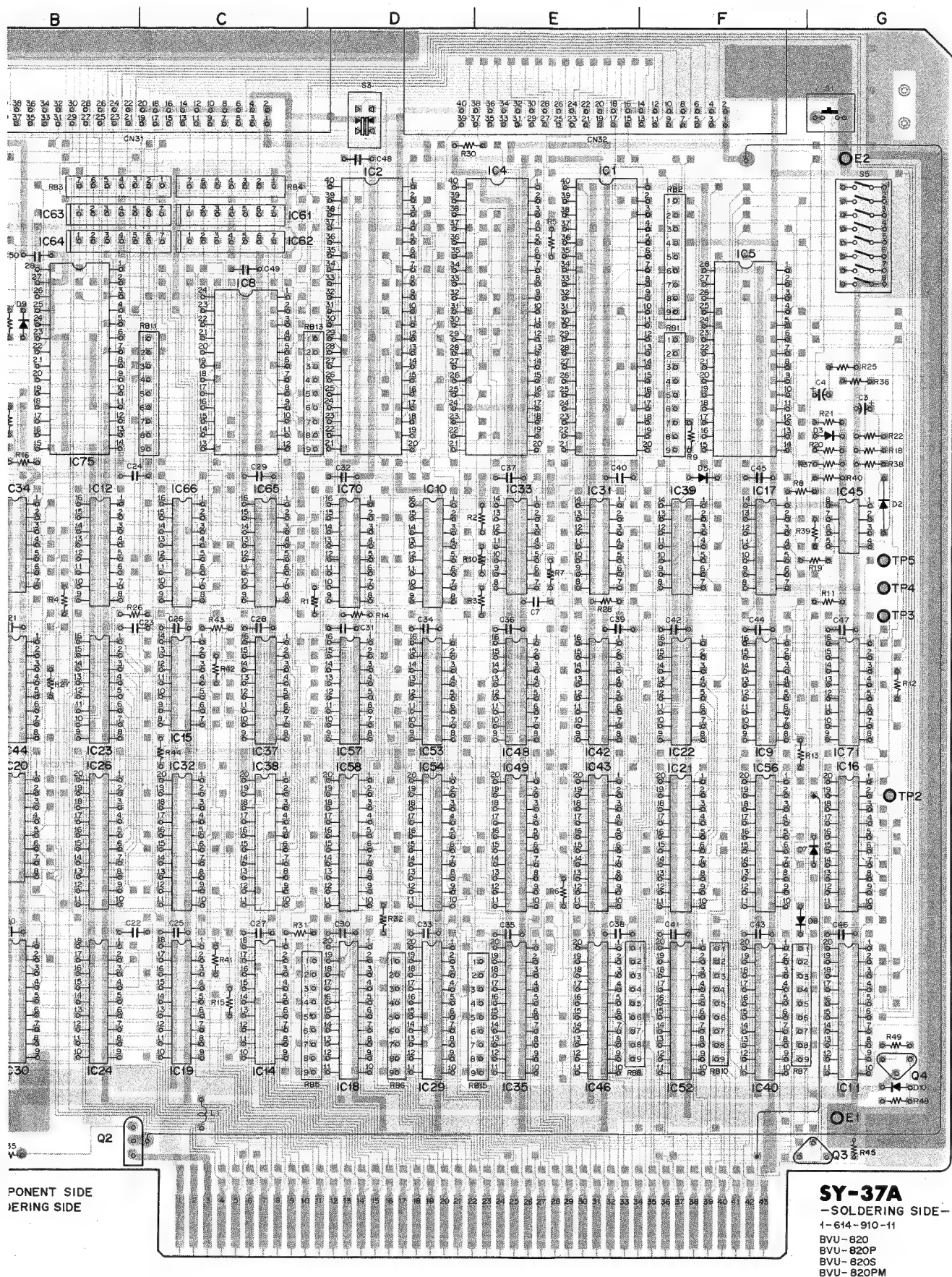


Serial No. 11616 and higher (PAL)  
Serial No. 10106 and higher (SECAM)

CN31 B-1	Q1 A-6
CN32 E-1	Q2 B-6
	Q3 G-6
	Q4 G-6
D1 A-6	RB1 F-2
D2 G-3	RB2 F-1
D3 G-2	RB3 B-1
D5 F-2	RB4 C-1
D7 G-5	RB5 D-6
D8 F-6	RB6 D-6
D9 B-1	RB7 F-6
D10 G-6	RB8 E-6
	RB10 F-6
E1 G-6	RB11 C-2
E2 G-1	RB13 D-2
E3 A-6	RB15 E-6
IC1 E-1	S1 G-1
IC2 D-1	S2 A-1
IC4 E-1	S3 D-1
IC5 F-2	S5 G-1
IC8 C-2	TP1 A-1
IC9 F-4	TP2 G-5
IC10 D-3	TP3 G-3
IC11 G-6	TP4 G-3
IC12 B-3	TP5 G-3
IC14 C-6	
IC15 C-4	X1 A-1
IC16 G-5	
IC17 F-3	
IC18 D-6	
IC19 C-6	
IC20 B-5	
IC21 F-5	
IC22 F-4	
IC23 B-4	
IC24 B-6	
IC25 A-5	
IC26 B-5	
IC27 A-1	
IC28 A-3	
IC29 D-6	
IC30 B-6	
IC31 E-3	
IC32 C-5	
IC33 E-3	
IC34 B-3	
IC35 E-6	
IC36 A-6	
IC37 C-4	
IC38 C-5	
IC39 F-3	
IC40 F-6	
IC41 A-6	
IC42 E-4	
IC43 E-5	
IC44 B-4	
IC45 G-3	
IC46 E-6	
IC48 E-4	
IC49 E-5	
IC50 A-4	
IC51 A-2	
IC52 F-6	
IC53 D-4	
IC54 D-5	
IC55 A-4	
IC56 F-5	
IC57 D-4	
IC58 D-5	
IC59 A-5	
IC61 C-1	
IC62 C-1	
IC63 B-1	
IC64 B-1	
IC65 C-3	
IC66 C-3	
IC70 D-3	
IC71 G-4	
IC73 A-3	
IC74 A-2	
IC75 B-2	

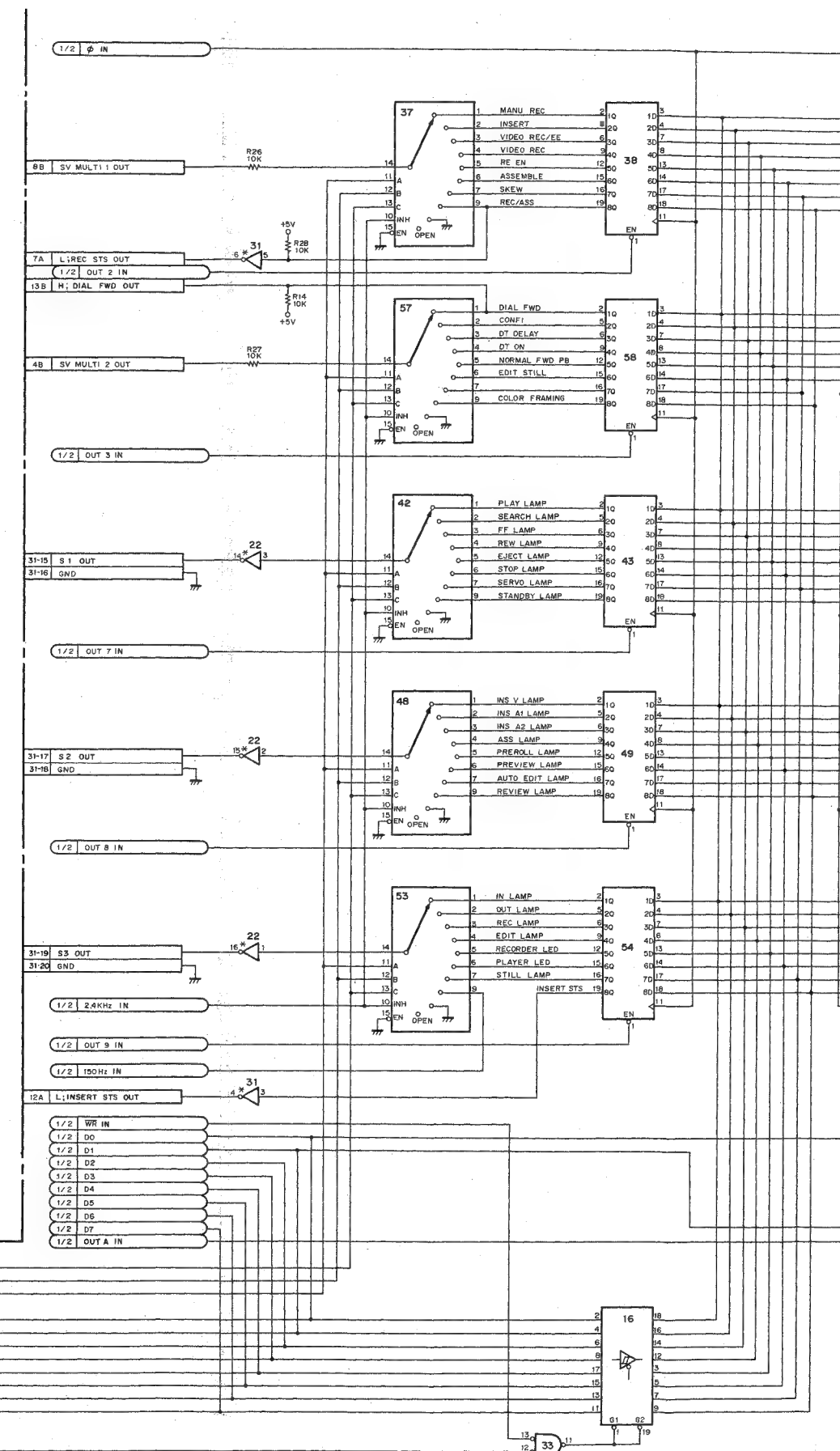
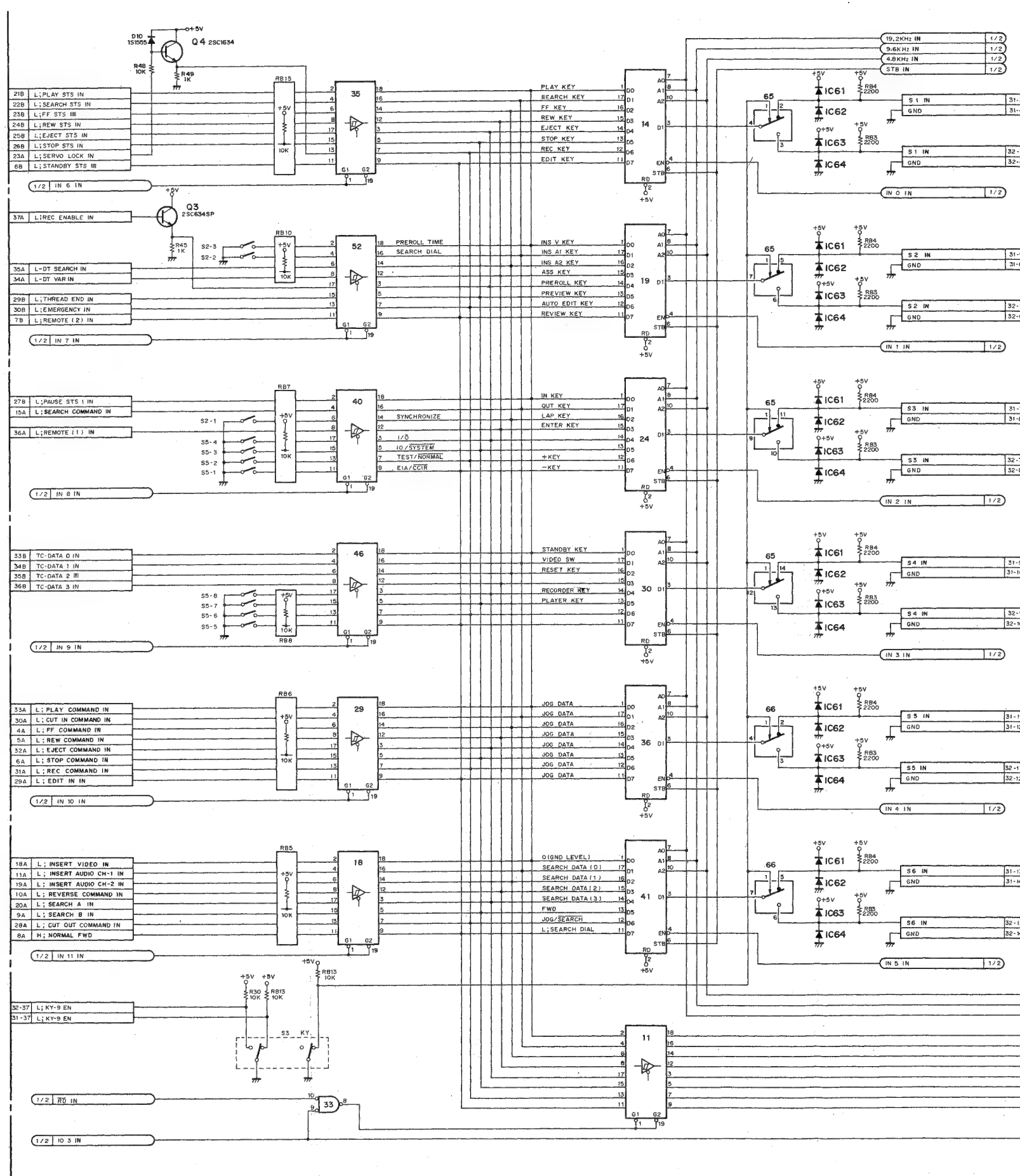






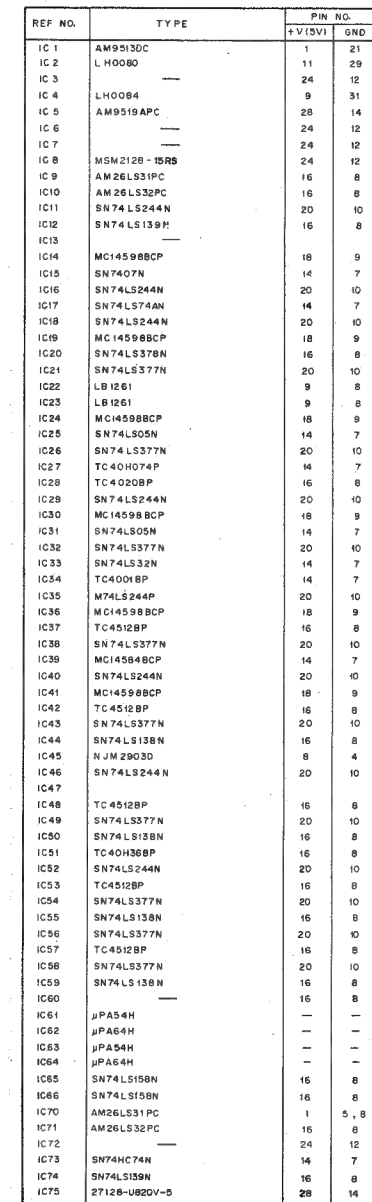


Serial No. 11616 and higher (PAL)  
Serial No. 10106 and higher (SECAM)



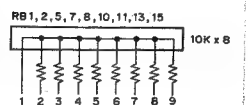
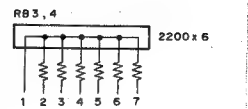
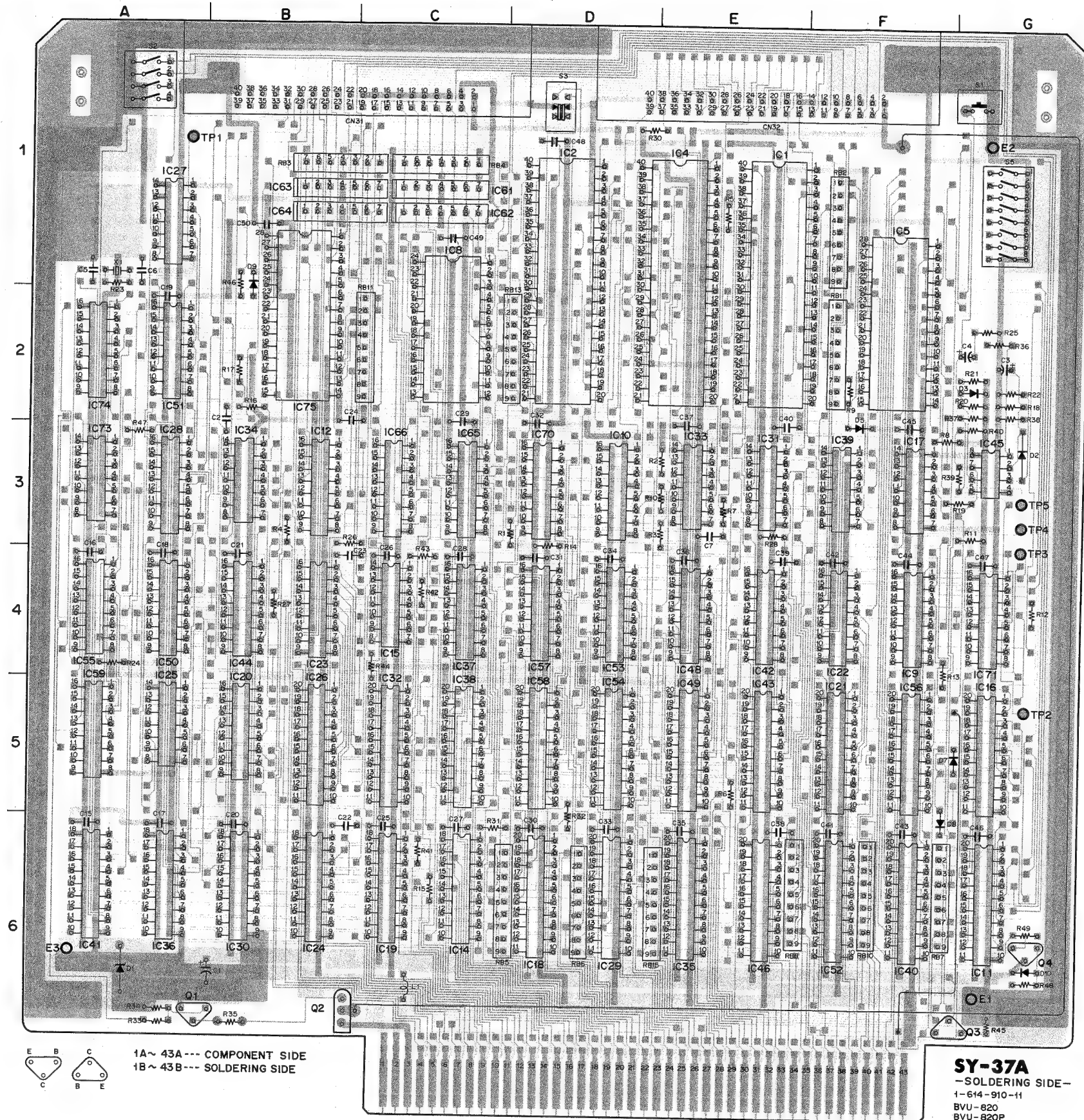


**SY-37A(2/2)**



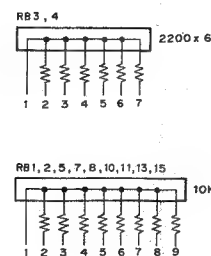
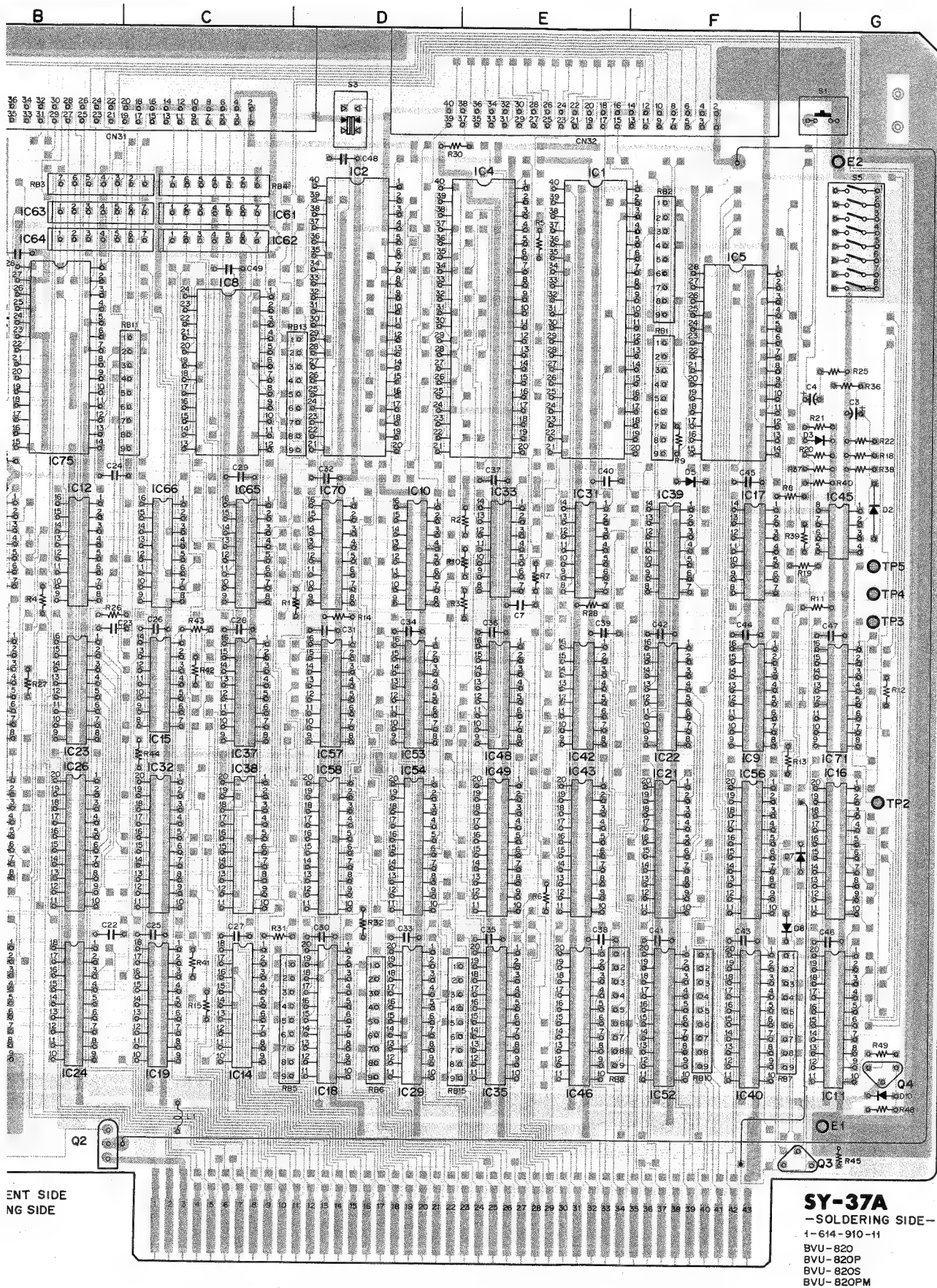


CN31 B-1	Q1 A-6
CN32 E-1	Q2 B-6
	Q3 G-6
	Q4 G-6
D1 A-6	RB1 F-2
D2 G-3	RB2 F-1
D3 G-2	RB3 B-1
D5 F-2	RB4 C-1
D7 G-5	RB5 D-6
D8 F-6	RB6 D-6
D9 B-1	RB7 F-6
D10 G-6	RB8 E-6
E1 G-6	RB10 F-6
E2 G-1	RB11 C-2
E3 A-6	RB13 D-2
	RB15 E-6
IC1 E-1	S1 G-1
IC2 D-1	S2 A-1
IC4 E-1	S3 D-1
IC5 F-2	S5 G-1
IC8 C-2	TP1 A-1
IC9 F-4	TP2 G-5
IC10 D-3	TP3 G-3
IC11 G-6	TP4 G-3
IC12 B-3	TP5 G-3
IC14 C-6	X1 A-1
IC15 C-4	
IC16 G-3	
IC17 F-3	
IC18 D-6	
IC19 C-6	
IC20 B-5	
IC21 F-5	
IC22 F-4	
IC23 B-4	
IC24 B-6	
IC25 A-5	
IC26 B-5	
IC27 A-1	
IC28 A-3	
IC29 D-6	
IC30 B-6	
IC31 E-3	
IC32 C-5	
IC33 E-3	
IC34 B-3	
IC35 E-6	
IC36 A-6	
IC37 C-4	
IC38 C-5	
IC39 F-3	
IC40 F-6	
IC41 A-6	
IC42 E-4	
IC43 E-5	
IC44 B-4	
IC45 G-3	
IC46 E-6	
IC48 E-4	
IC49 E-5	
IC50 A-4	
IC51 A-2	
IC52 F-6	
IC53 D-4	
IC54 D-5	
IC55 A-4	
IC56 F-5	
IC57 D-4	
IC58 D-5	
IC59 A-5	
IC61 C-1	
IC62 C-1	
IC63 B-1	
IC64 B-1	
IC65 C-3	
IC66 C-3	
IC70 D-3	
IC71 G-4	
IC73 A-3	
IC74 A-2	
IC75 B-2	



**SY-37A**  
 -SOLDERING SIDE-  
 1-614-910-11  
 BVU-820  
 BVU-820P  
 BVU-820S  
 BVU-820PM

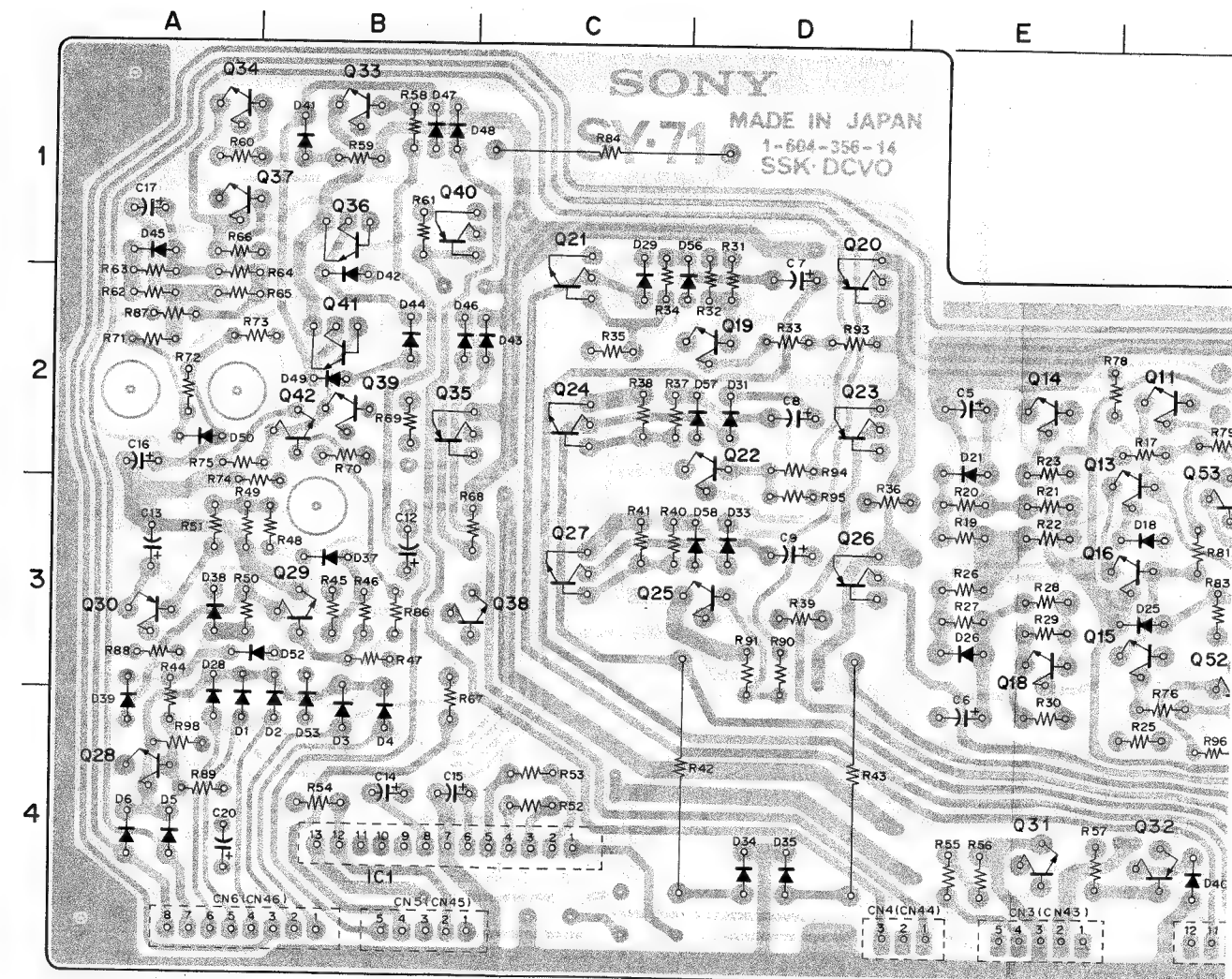






## SY-71 (MOTOR/SOLENOID DRIVER)

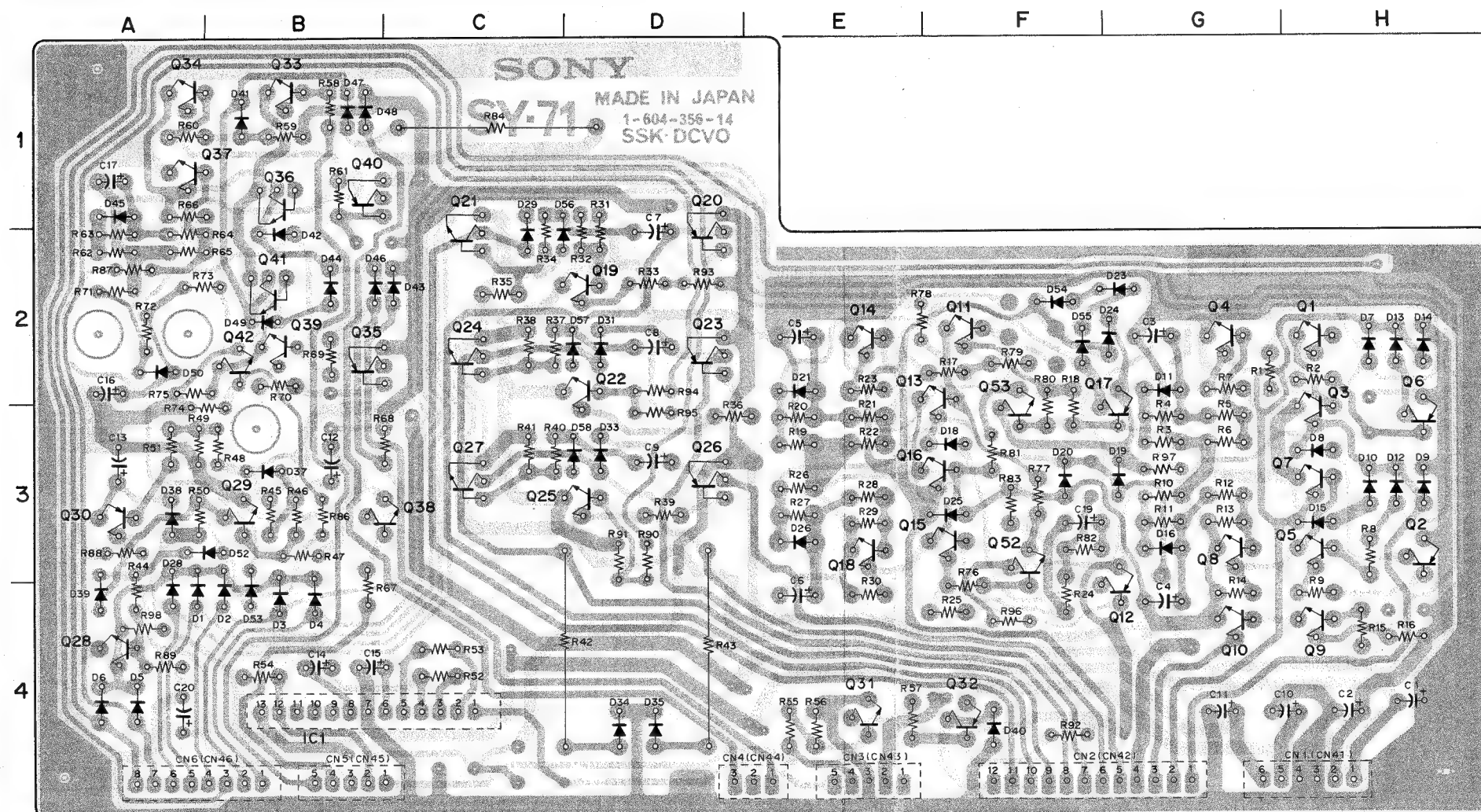
CN1	H-4
CN2	F-4
CN3	E-4
CN4	E-4
CN5	B-4
CN6	A-4
D1	A-4
D2	B-4
D3	B-4
D4	B-4
D5	A-4
D6	A-4
D7	H-2
D8	H-3
D9	H-3
D10	H-3
D11	G-2
D12	H-3
D13	H-2
D14	H-2
D15	H-3
D16	G-3
D18	F-3
D19	G-3
D20	F-3
D21	E-2
D22	F-3
D23	G-2





SY-71 (MOTOR/SOLENOID DRIVER)

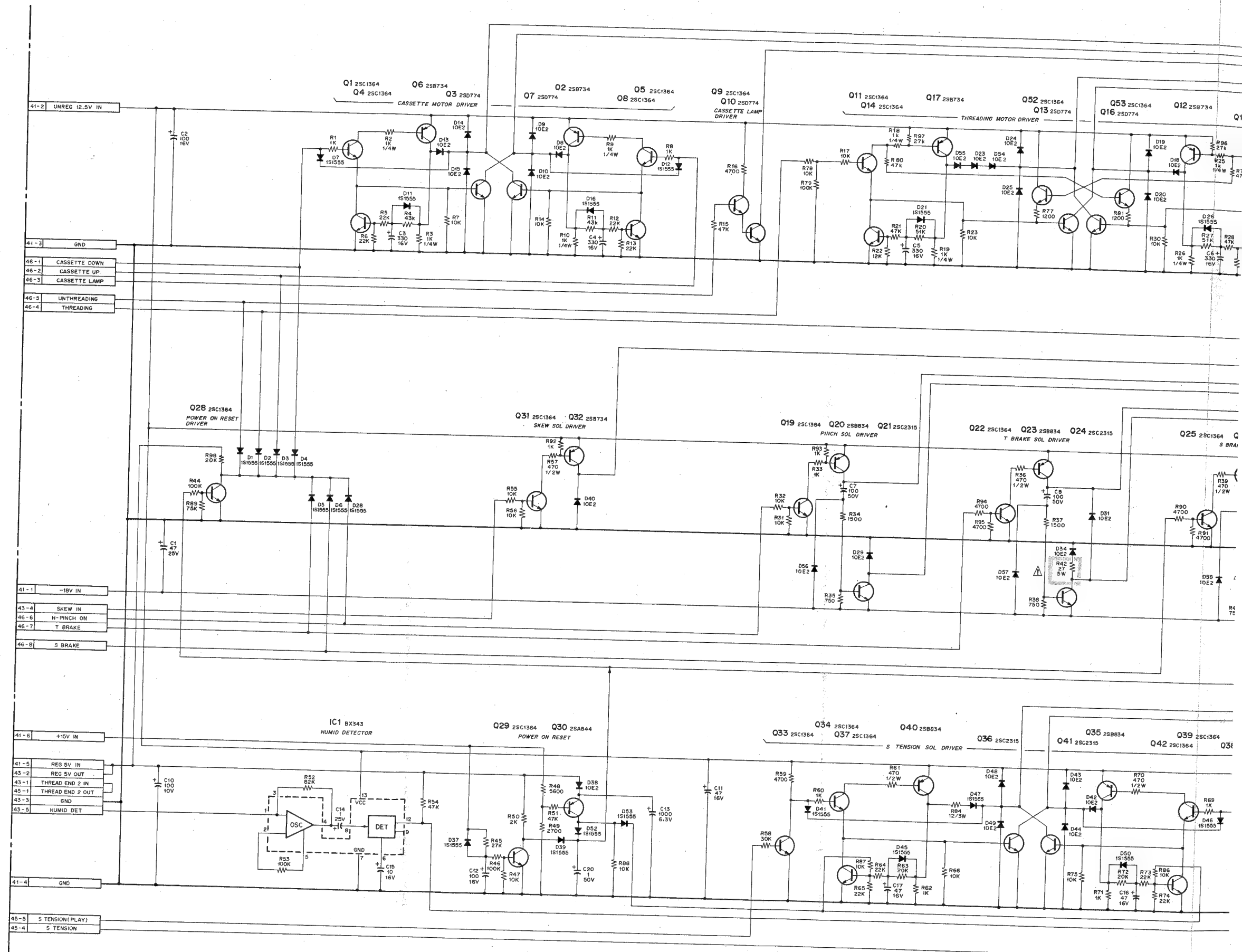
CN1	H - 4	D24	G - 2	IC1	B - 4	Q29	B - 3
CN2	F - 4	D25	F - 3			Q30	A - 3
CN3	E - 4	D26	E - 3	Q1	H - 2	Q31	E - 4
CN4	E - 4	D28	A - 4	Q2	H - 3	Q32	F - 4
CN5	B - 4	D29	C - 2	Q3	H - 3	Q33	B - 1
CN6	A - 4	D31	D - 2	Q4	G - 2	Q34	A - 1
		D33	D - 3	Q5	H - 3	Q35	B - 2
D1	A - 4	D34	D - 4	Q6	H - 3	Q36	B - 1
D2	B - 4	D35	D - 4	Q7	H - 3	Q37	A - 1
D3	B - 4	D37	B - 3	Q8	G - 3	Q38	B - 3
D4	B - 4	D38	A - 3	Q9	H - 4	Q39	B - 2
D5	A - 4	D39	A - 4	Q10	G - 4	Q40	B - 1
D6	A - 4	D40	F - 4	Q11	F - 2	Q41	B - 2
D7	H - 2	D41	B - 1	Q12	G - 4	Q42	B - 2
D8	H - 3	D42	B - 2	Q13	F - 2	Q52	F - 3
D9	H - 3	D43	C - 2	Q14	E - 2	Q53	F - 3
D10	H - 3	D44	B - 2	Q15	F - 3		
D11	G - 2	D45	A - 1	Q16	F - 3		
D12	H - 3	D46	B - 2	Q17	G - 3		
D13	H - 2	D47	B - 1	Q18	E - 3		
D14	H - 2	D48	B - 1	Q19	D - 2		
D15	H - 3	D49	B - 2	Q20	D - 2		
D16	G - 3	D50	A - 2	Q21	C - 2		
D18	F - 3	D52	A - 3	Q22	D - 2		
D19	G - 3	D53	B - 4	Q23	D - 2		
D20	F - 3	D54	F - 2	Q24	C - 2		
D21	E - 2	D55	F - 2	Q25	D - 3		
D22	F - 3	D56	D - 1	Q26	D - 3		
D23	G - 2	D57	D - 2	Q27	C - 3		
		D58	D - 3	Q28	A - 4		



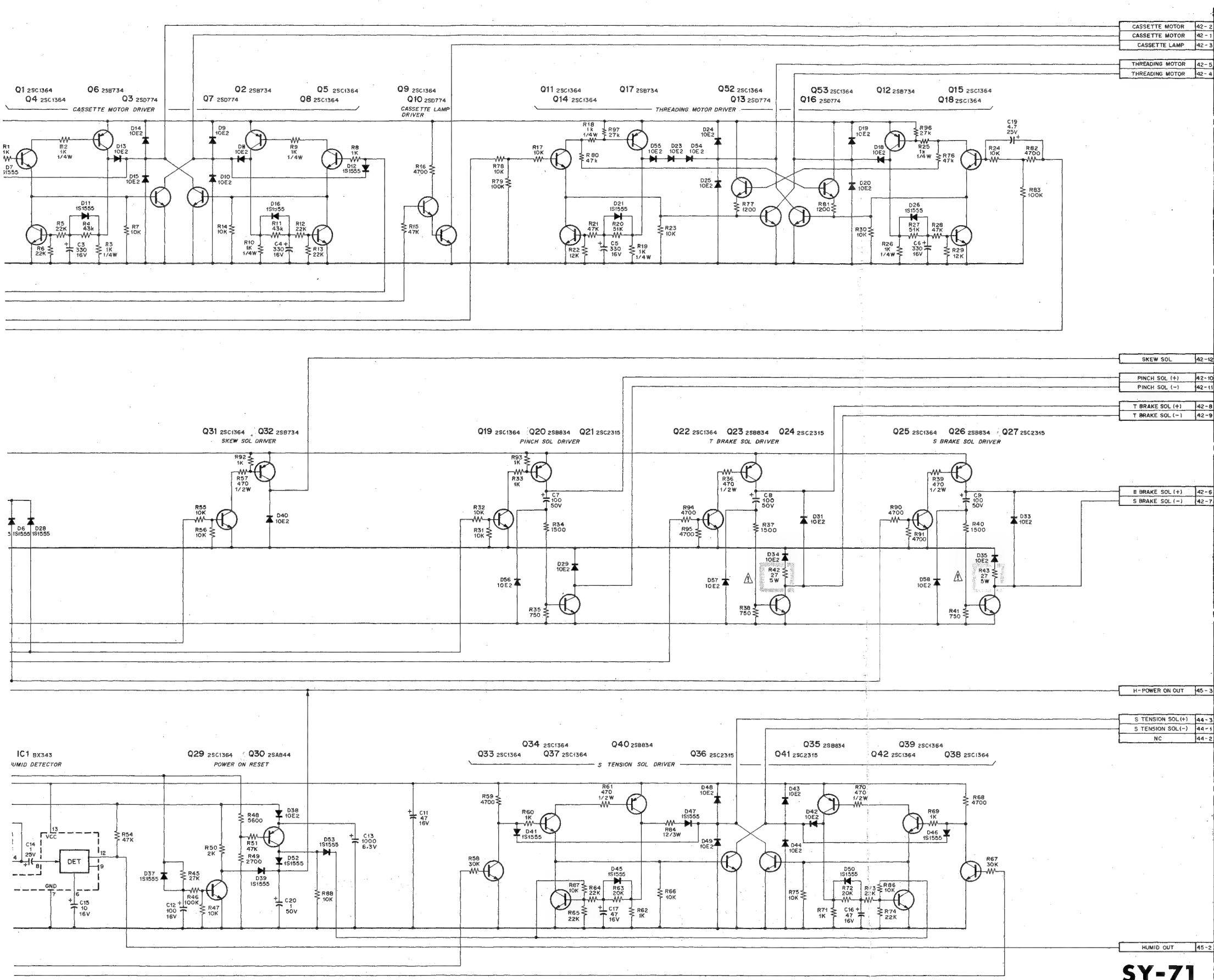
SY-71 — SOLDERING SIDE —  
1-604-356-14  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM



SY-71 (MOTOR/SOLENOID DRIVER)





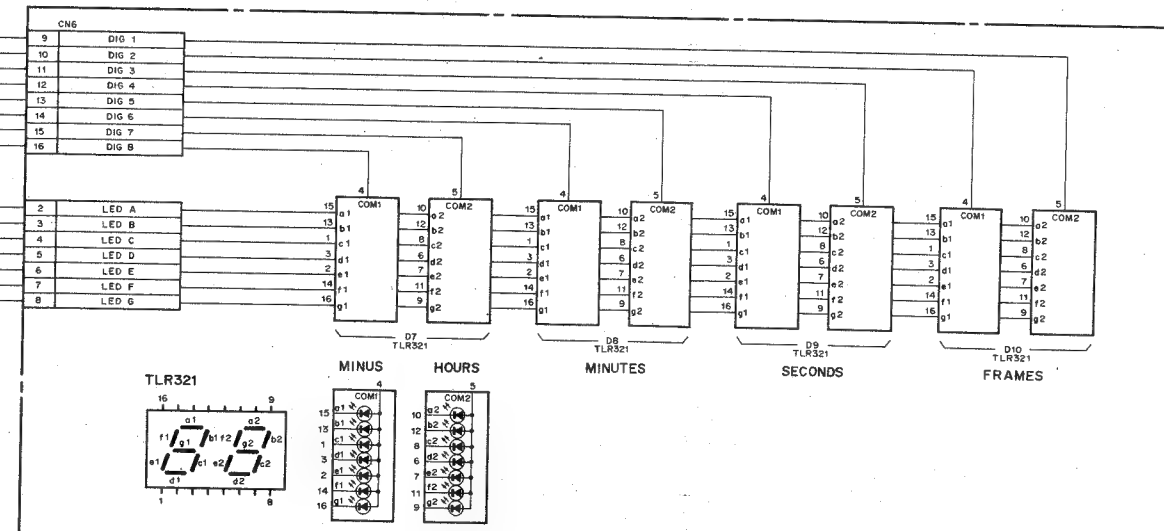
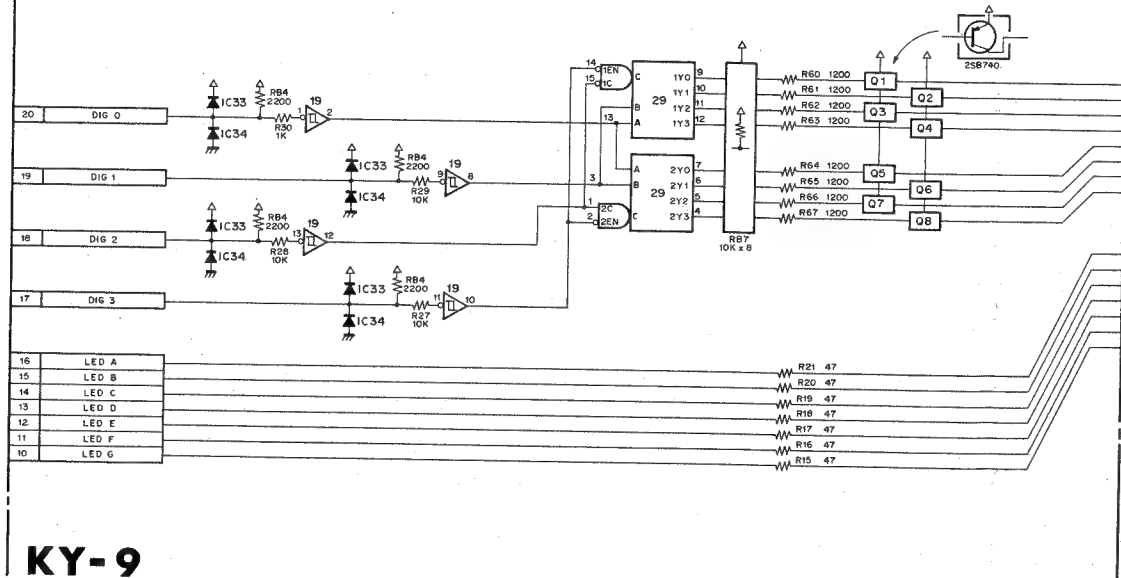
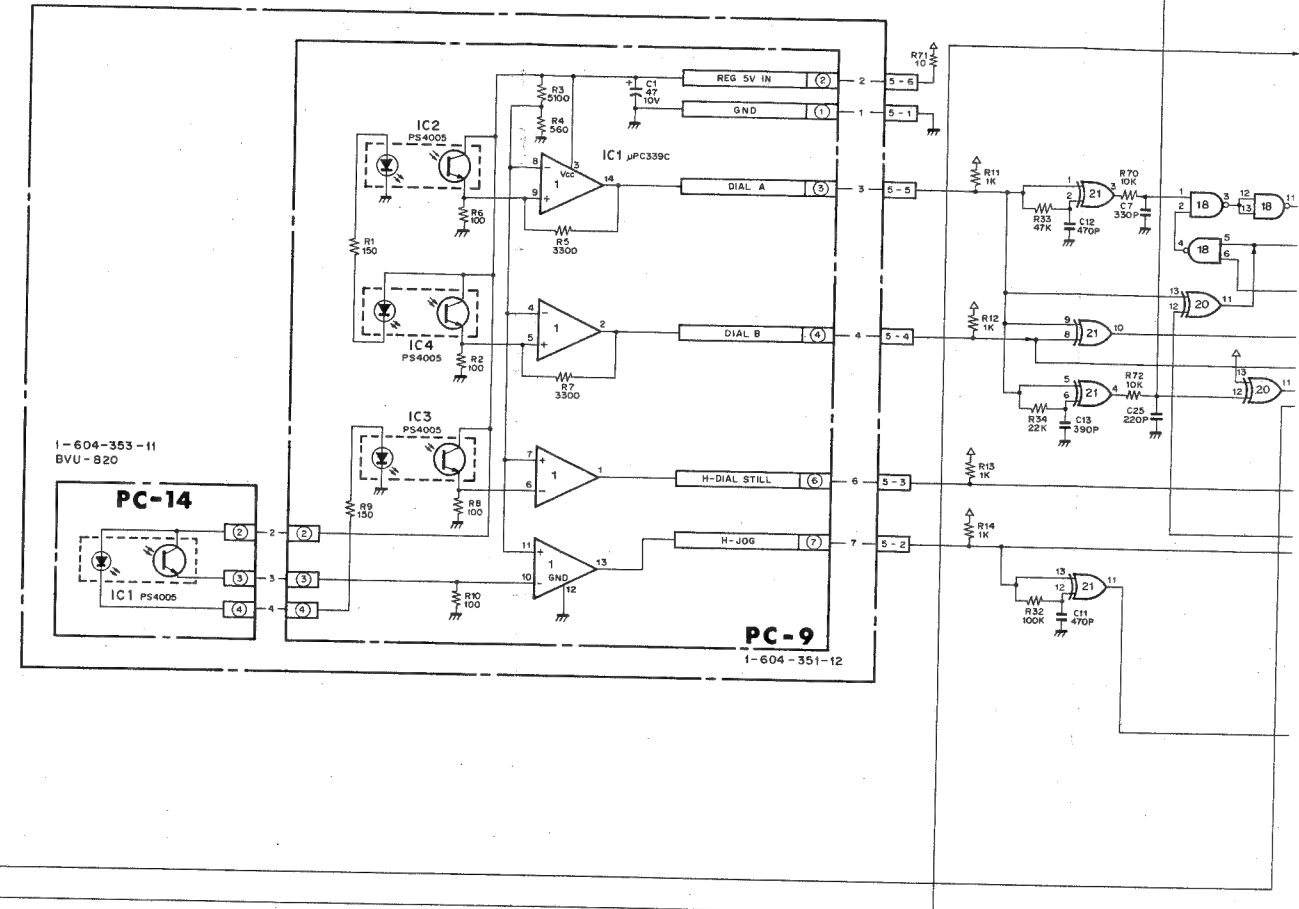
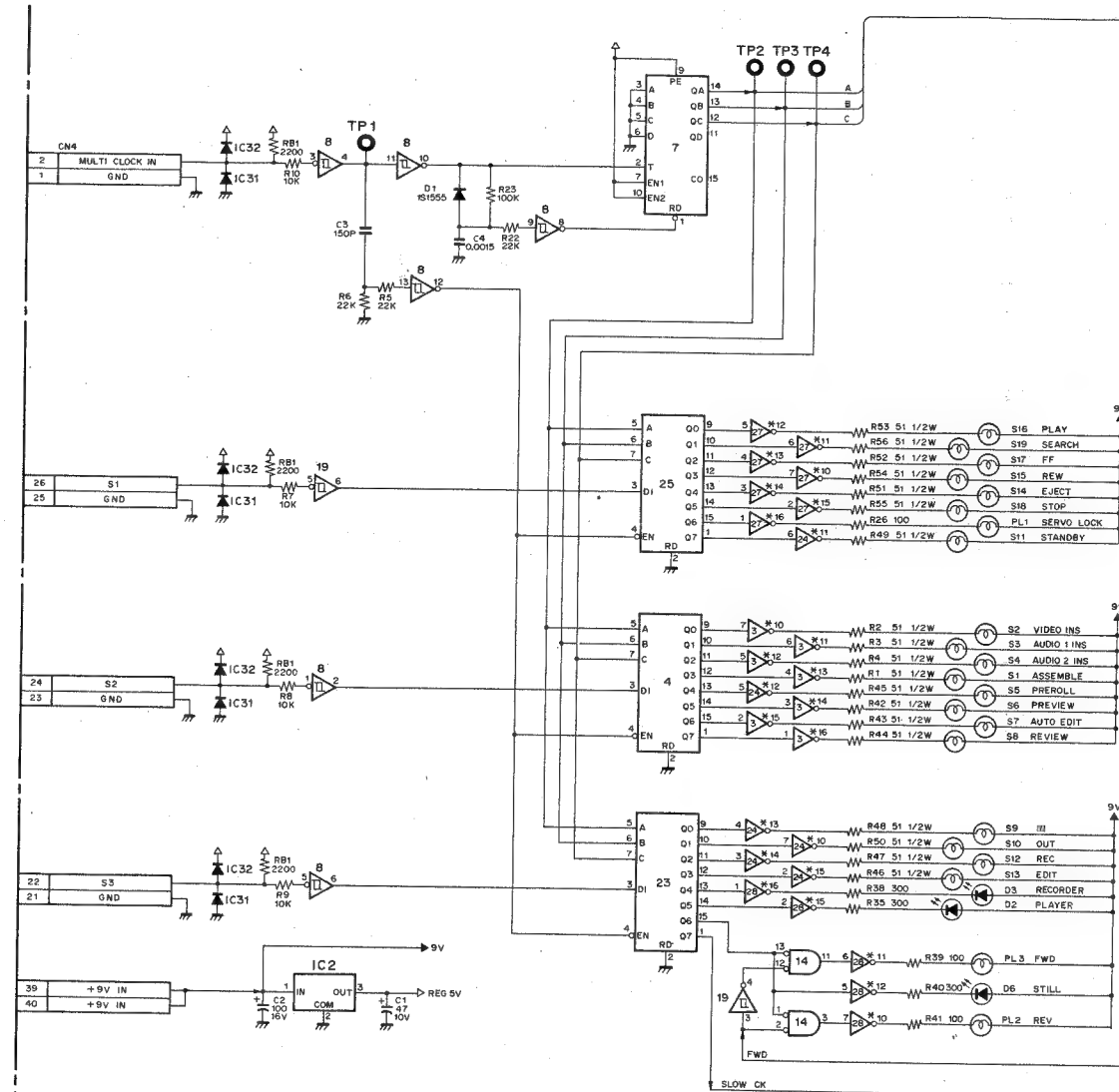


**SY-71**  
1-604-356-14  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM

**NOTE:**  
The shaded and A-marked components are critical to safety.  
Replace only with same components as specified.

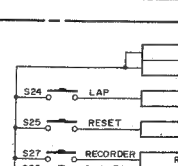
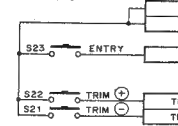


KY-9, KY-14 (KEY BOARD)  
DP-9 (DISPLAY)  
PC-9, PC-14 (SEARCH DIAL)



1-604-347-11,12  
BVU-820

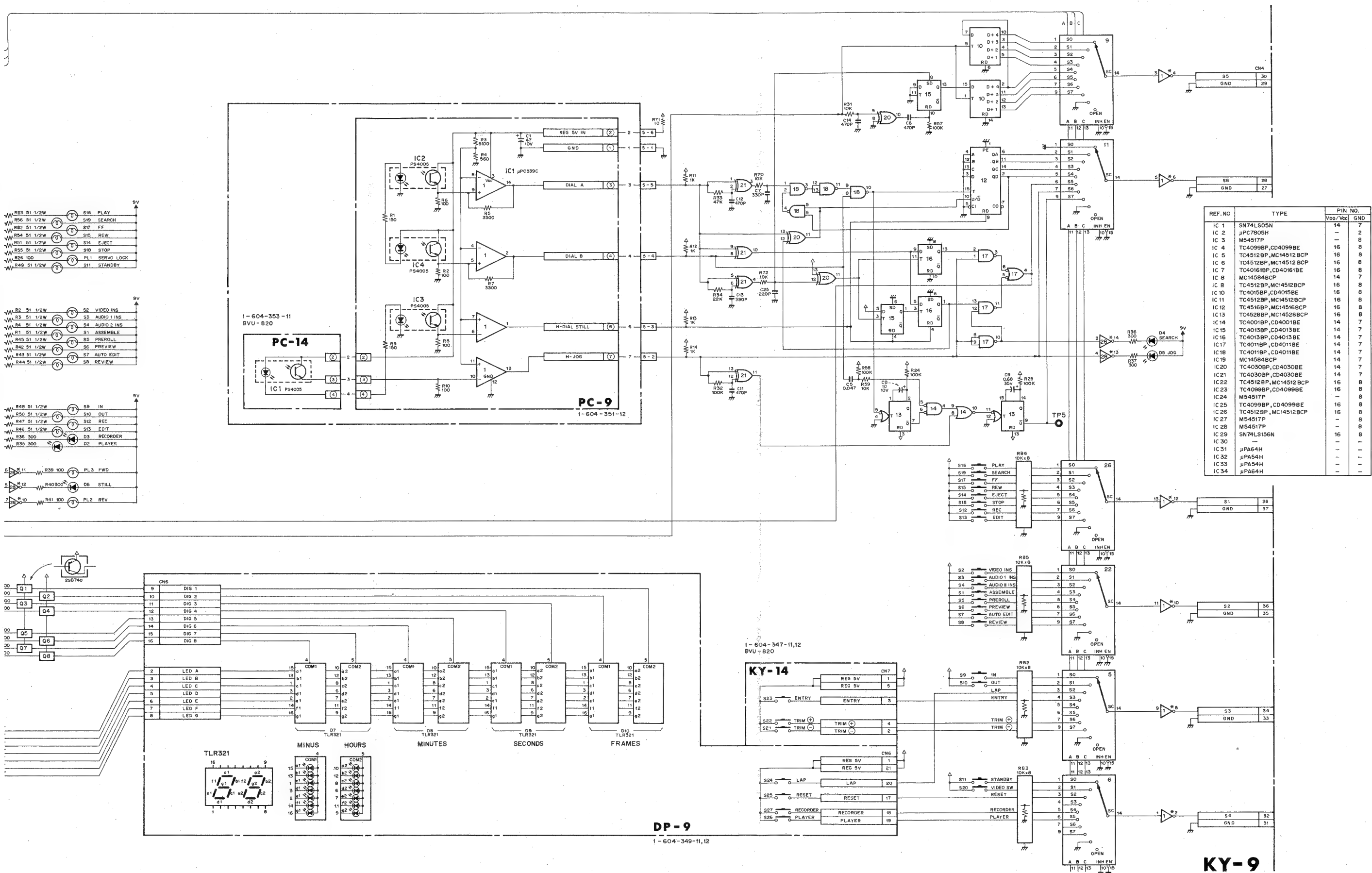
KY-14



DP-9

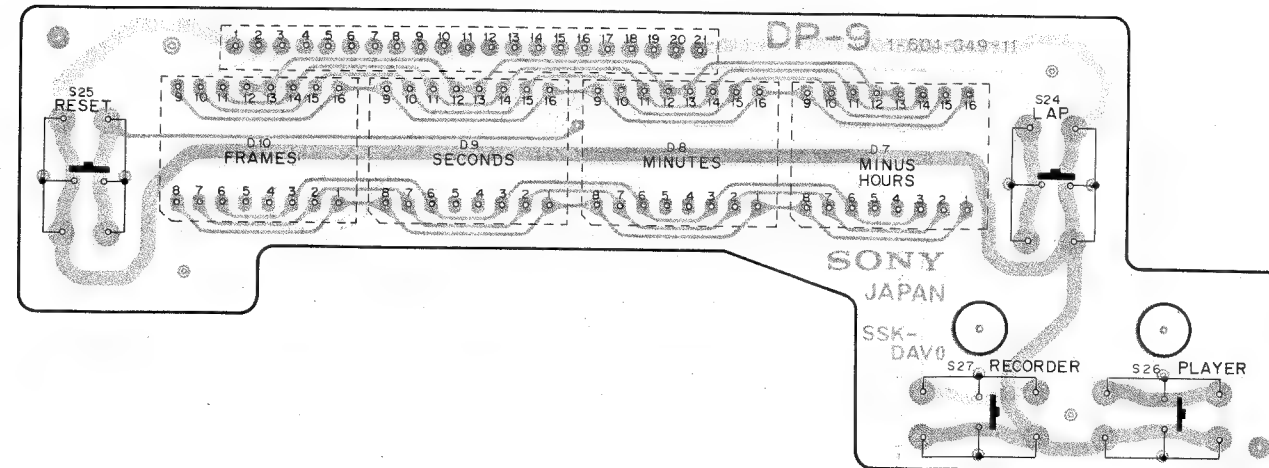
1-604-349-11,12



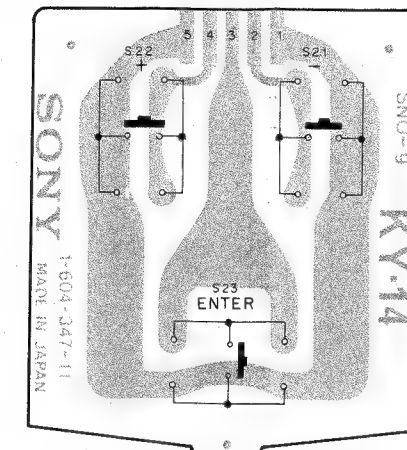




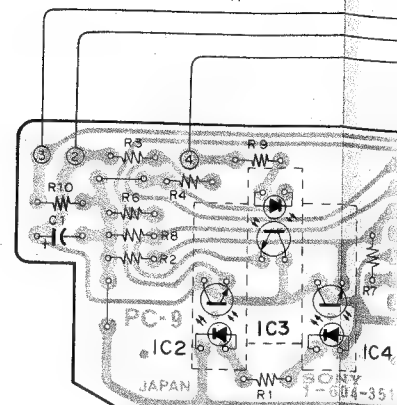
KY-9, KY-14 (KEY BOARD)  
 DP-9 (DISPLAY)  
 PC-9, PC-14 (SEARCH DIAL)



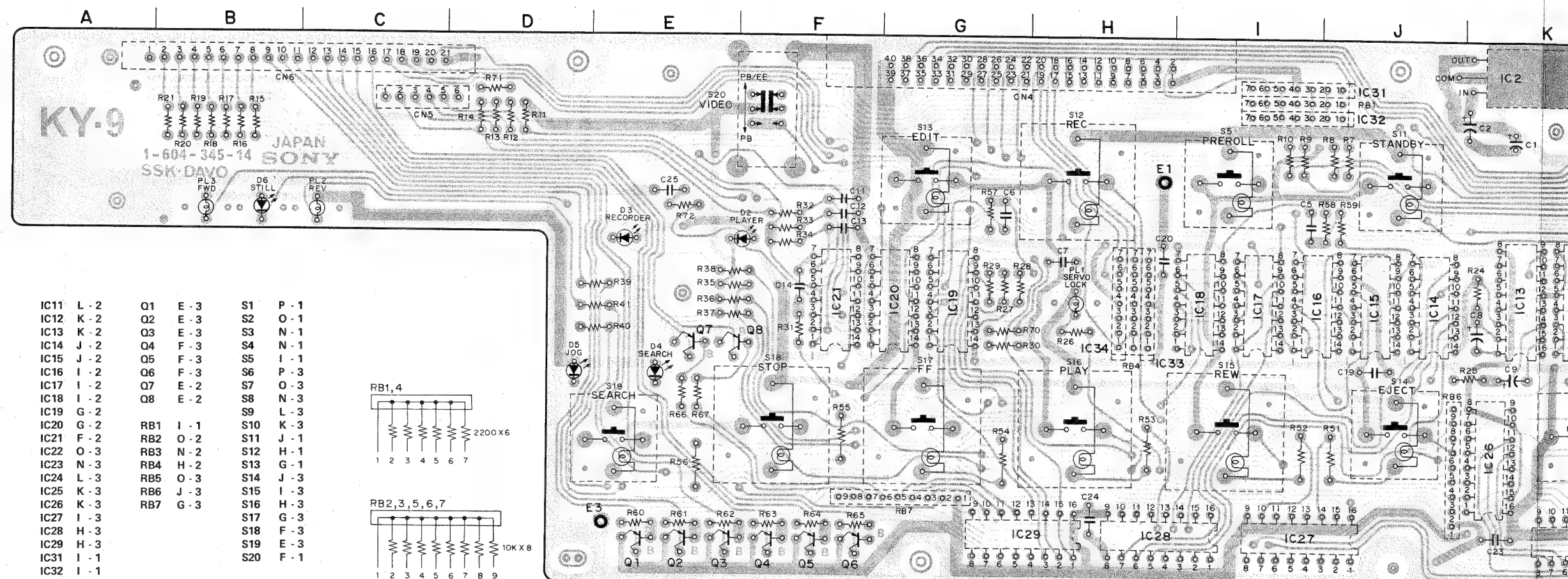
DP-9-SOLDERING SIDE -  
 1-604-349-11,12



KY-14-SOLDERING SIDE -  
 1-604-347-11,12

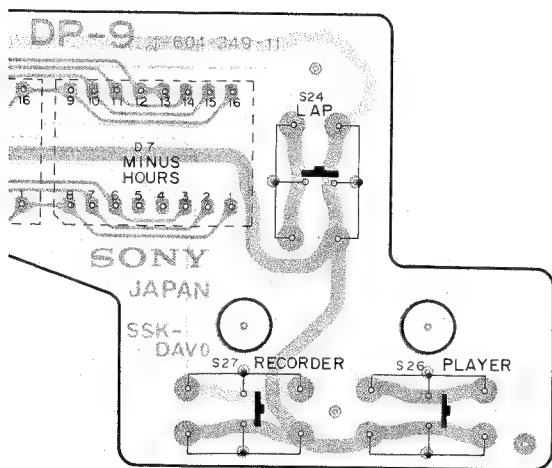


PC-9-SOLDER  
 1-604-351-13

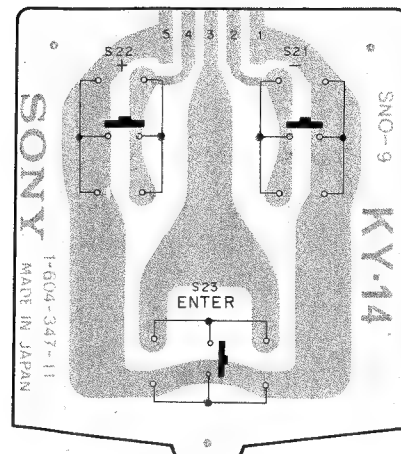


CN4	G-1	IC11	L-2	Q1	E-3	S1	P-1
CN5	C-1	IC12	K-2	Q2	E-3	S2	O-1
CN6	B-1	IC13	K-2	Q3	E-3	S3	N-1
CN7	L-1	IC14	J-2	Q4	F-3	S4	N-1
		IC15	J-2	Q5	F-3	S5	I-1
D1	N-2	IC16	I-2	Q6	F-3	S6	P-3
D2	E-2	IC17	I-2	Q7	E-2	S7	O-3
D3	E-2	IC18	I-2	Q8	E-2	S8	N-3
D4	E-2	IC19	G-2			S9	L-3
D5	E-2	IC20	G-2	RB1	I-1	S10	K-3
D6	B-1	IC21	F-2	RB2	O-2	S11	J-1
		IC22	O-3	RB3	N-2	S12	H-1
E1	H-1	IC23	N-3	RB4	H-2	S13	G-1
E2	P-3	IC24	L-3	RB5	O-3	S14	J-3
E3	E-3	IC25	K-3	RB6	J-3	S15	I-3
		IC26	K-3	RB7	G-3	S16	H-3
IC1	N-1	IC27	I-3			S17	G-3
IC2	K-1	IC28	H-3			S18	F-3
IC3	P-2	IC29	H-3			S19	E-3
IC4	O-2	IC31	I-1			S20	F-1
IC5	O-2	IC32	I-1				
IC6	N-2	IC33	H-2			TP1	M-1
IC7	N-2	IC34	H-2			TP2	O-3
IC8	M-2					TP3	O-3
IC9	M-2					TP4	L-3
IC10	L-2					TP5	L-3

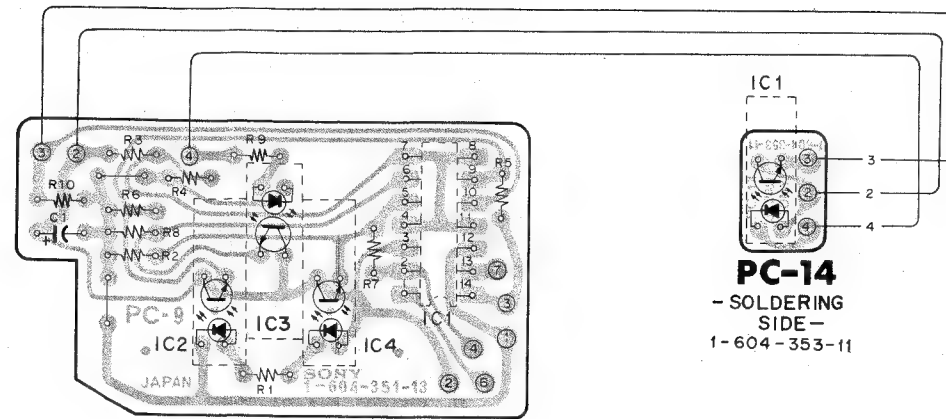




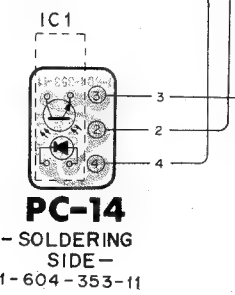
**DP-9**—SOLDERING SIDE—  
1-604-349-11,12



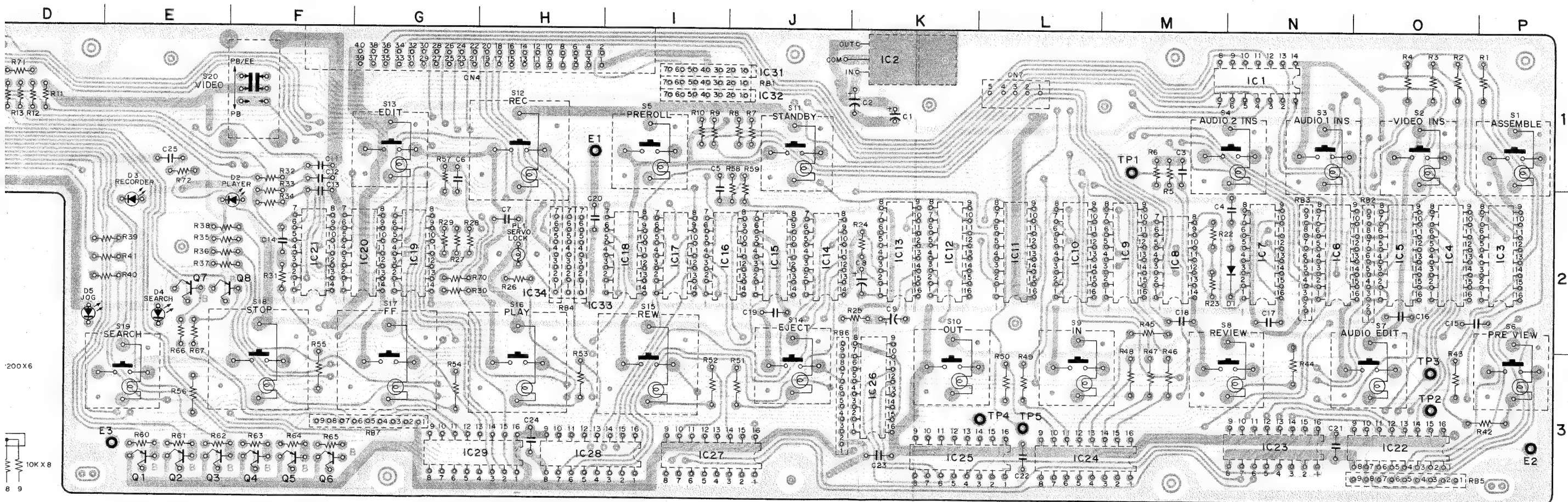
**KY-14**—SOLDERING SIDE—  
1-604-347-11,12



**PC-9**—SOLDERING SIDE—  
1-604-351-13



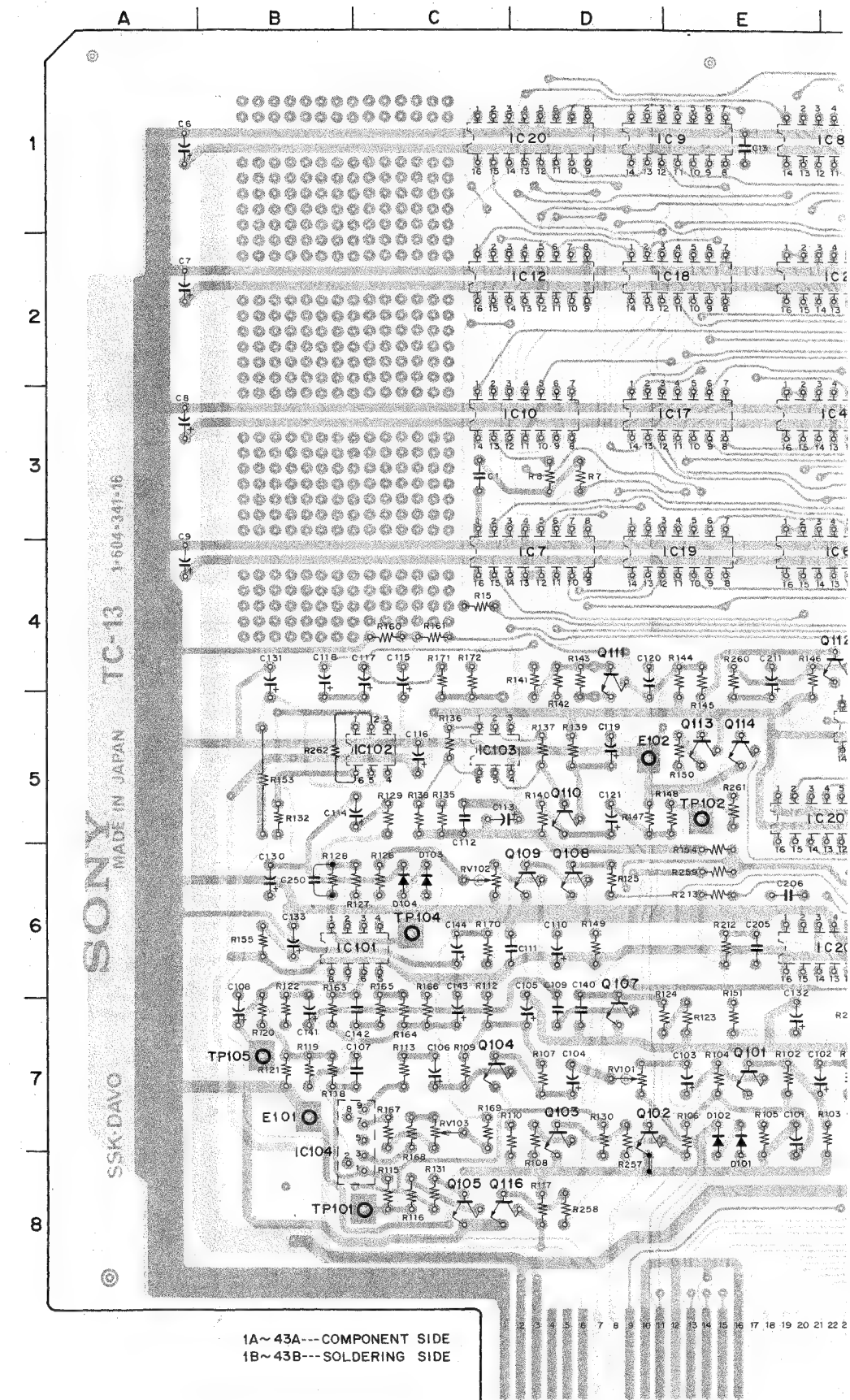
**PC-14**  
—SOLDERING SIDE—  
1-604-353-11



**KY-9** —SOLDERING SIDE—  
1-604-345-14  
BVU-820 (S/N.10001~10550 (U/C))  
                  (S/N.10646~10647 (U/C))  
                  (S/N.10001~10002 (J))  
BVU-820P (S/N.10001~10250)  
                  (S/N.10301~10302)  
BVU-820S (S/N.10001~10002)  
BVU-820PM (S/N.10006~10007)

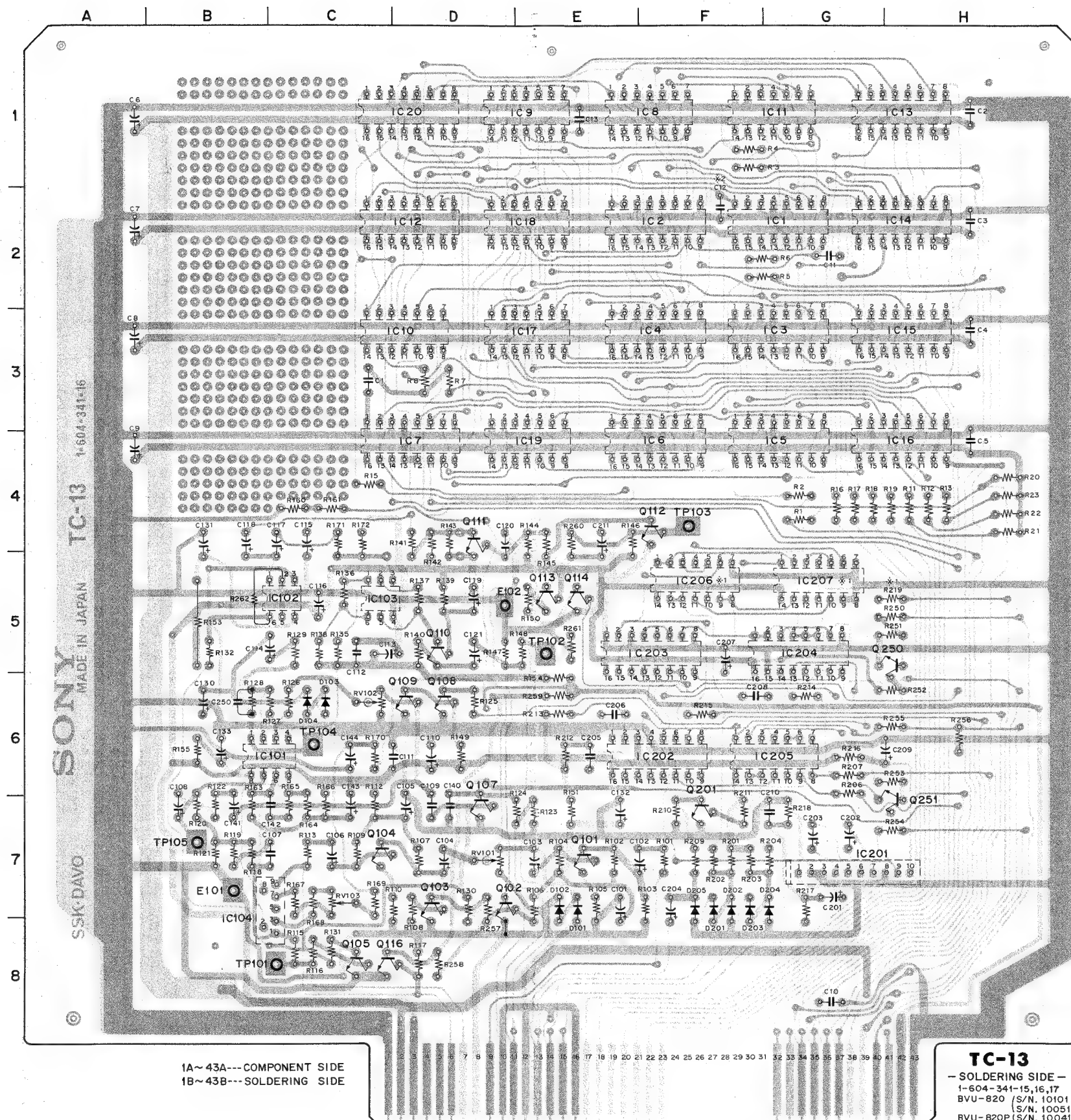


TC-13-1 (TIME CODE REC/PB AMPLIFIER)  
(CTL COUNTER)  
(SERVO REF SYNC SELECTOR)





TC-13-1 (TIME CODE REC/PB AMPLIFIER)  
(CTL COUNTER)  
(SERVO REF SYNC SELECTOR)



- D101 E-7
- D102 E-7
- D103 C-6
- D104 C-6
- D201 F-7
- D202 F-7
- D203 F-7
- D204 G-7
- D205 F-7
- E101 B-7
- E102 D-5
- IC1 G-2
- IC2 F-2
- IC3 G-3
- IC4 F-3
- IC5 G-4
- IC6 F-4
- IC7 D-4
- IC8 F-1
- IC9 E-1
- IC10 D-3
- IC11 G-1
- IC12 D-2
- IC13 H-1
- IC14 H-2
- IC15 H-3
- IC16 H-4
- IC17 E-3
- IC18 E-2
- IC19 E-4
- IC20 D-1
- IC101 B-6
- IC102 C-5
- IC103 C-5
- IC104 B-7
- IC201 G-7
- IC202 F-6
- IC203 F-5
- IC204 G-5
- IC205 G-6
- IC206 F-5
- IC207 G-5
- Q101 E-7
- Q102 D-7
- Q103 D-7
- Q104 C-7
- Q105 C-8
- Q107 D-7
- Q108 D-6
- Q109 D-6
- Q110 D-5
- Q111 D-4
- Q112 F-4
- Q113 E-5
- Q114 E-5
- Q116 C-8
- Q201 F-7
- Q250 H-5
- Q251 H-7
- RV101 D-7
- RV102 C-6
- RV103 C-7
- TP101 C-8
- TP102 E-5
- TP103 F-4
- TP104 C-6
- TP105 B-7

NOTE (1)

		NTSC/PM	PAL/SECAM
*1	IC206 IC207 R219	NOT MOUNTED	MOUNTED
*2	C12	MOUNTED	NOT MOUNTED

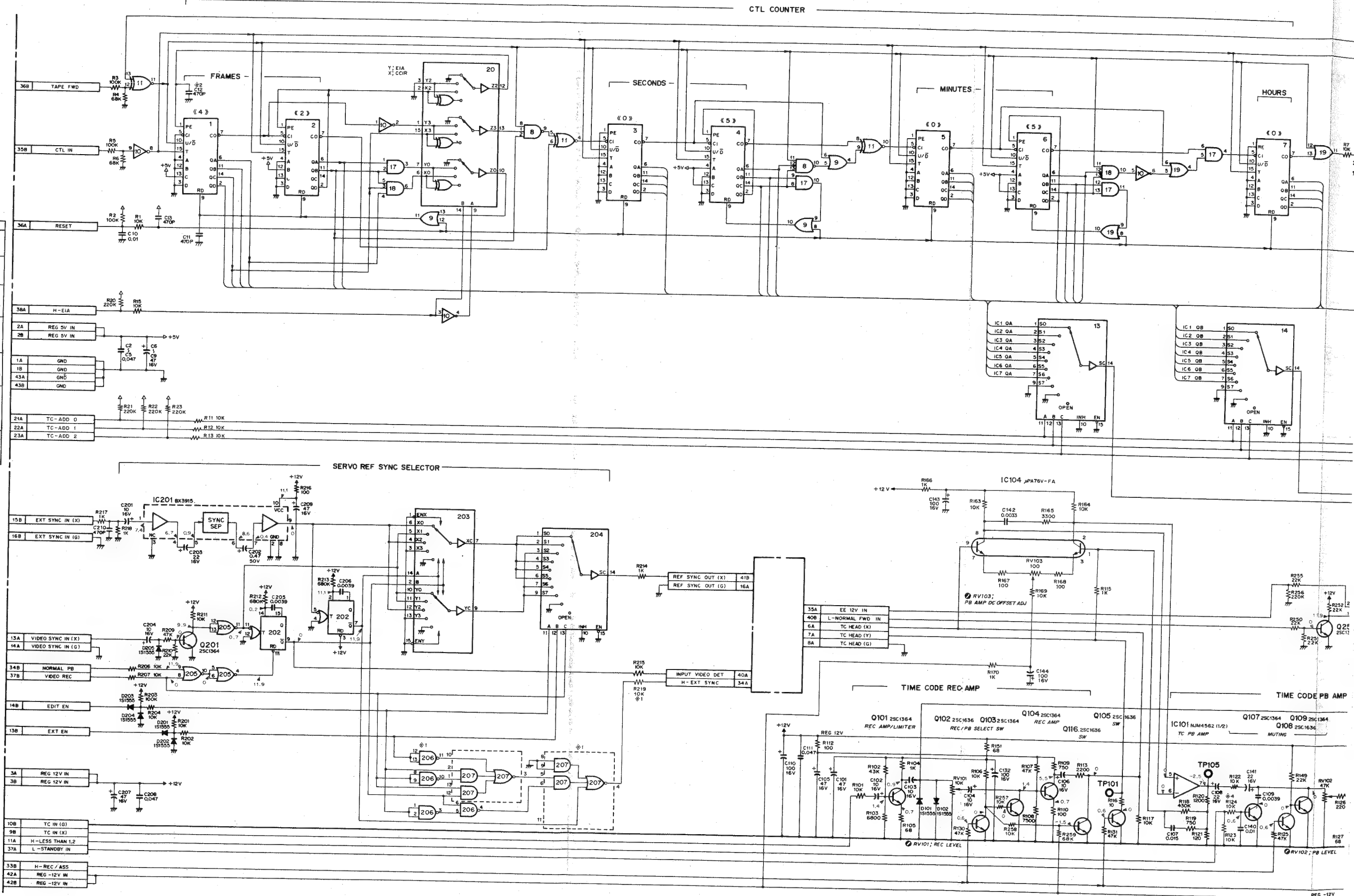
1A~43A---COMPONENT SIDE  
1B~43B---SOLDERING SIDE

**TC-13**  
- SOLDERING SIDE -  
1-604-341-15,16,17  
BVU-820 (S/N. 10101~ (U/C)  
S/N. 10051~ (J)  
BVU-820P (S/N. 10041~ )  
BVU-820S (S/N. 10001~ )  
BVU-820PM (S/N. 10001~ )

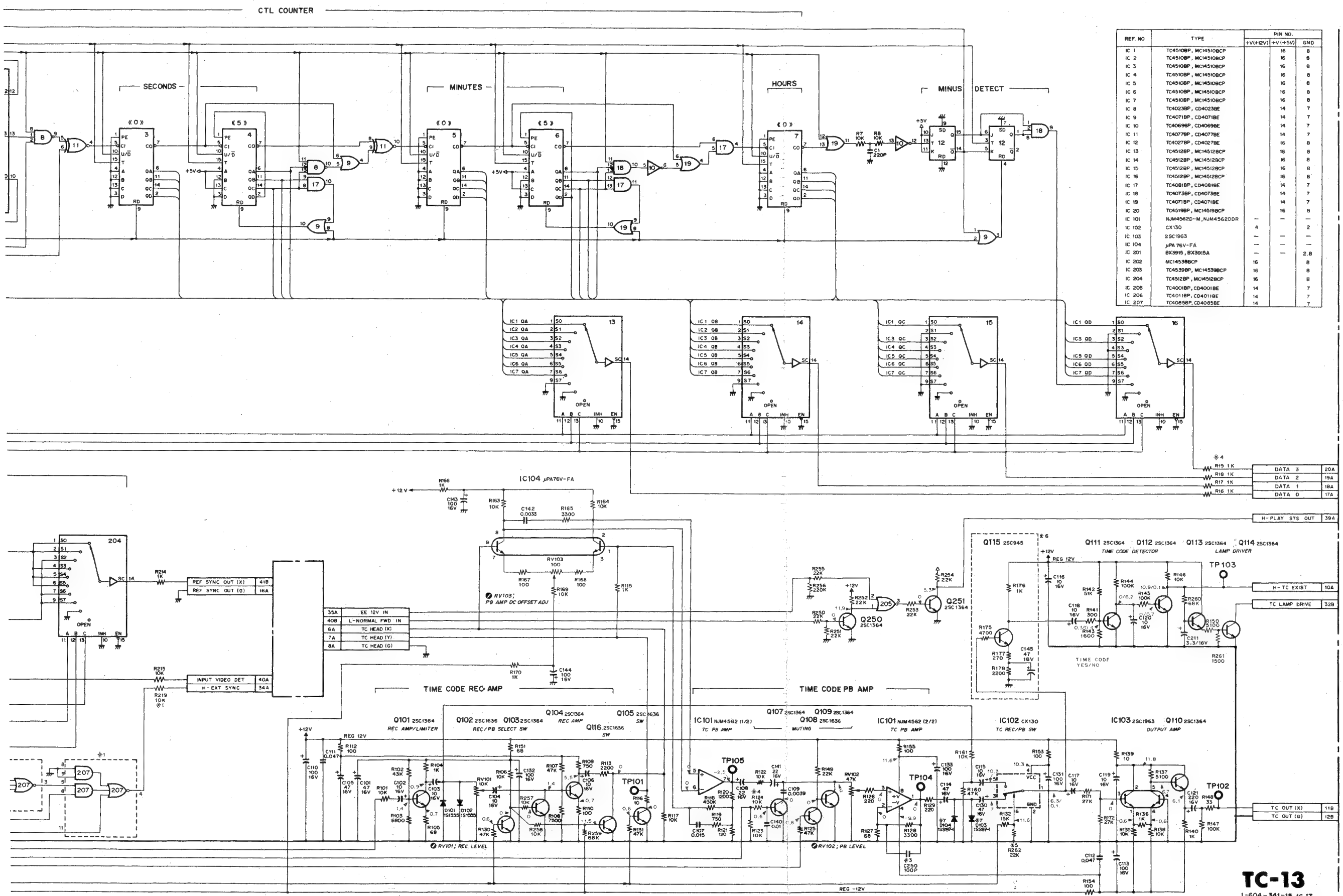


TC-13-1 (TIME CODE REC/PB AMPLIFIER)  
(CTL COUNTER)  
(SERVO REF SYNC SELECTOR)

MARK	CHANGE INFORMATION	SERIAL NO.
1	IC206 NTSC/PM NOT MOUNTED IC207 PAL/SECAM MOUNTED	
2	C12 NTSC/PM MOUNTED PAL/SECAM NOT MOUNTED	
3	C250 100P ADDED	10101~(U/C) 10051~(J) 10041~(PAL) 10001~(SECAM) 10001~(PM)
4	R16, 17, 18, 19 10K → 1K R124 47K → 10K	10646~(U/C) 10201~(J) 10301~(PAL) 10051~(SECAM) 10006~(PM)
5	R262 22K ADDED	11506~(U/C) 10481~(J) 11526~(PAL) 10071~(SECAM) 10021~(PM)
6	ADDED C145 47/16V C115 25C3-45 R175 4700 R176 1K R177 270 R178 2200	11956~(U/C) 10631~(J) 11566~(PAL) 10106~(SECAM) 10046~(PM)
7	D103,104 1S1925 → 1S597-1	12124~(U/C) 10631~(J) 11691~(PAL) 10116~(SECAM) 10081~(PM)





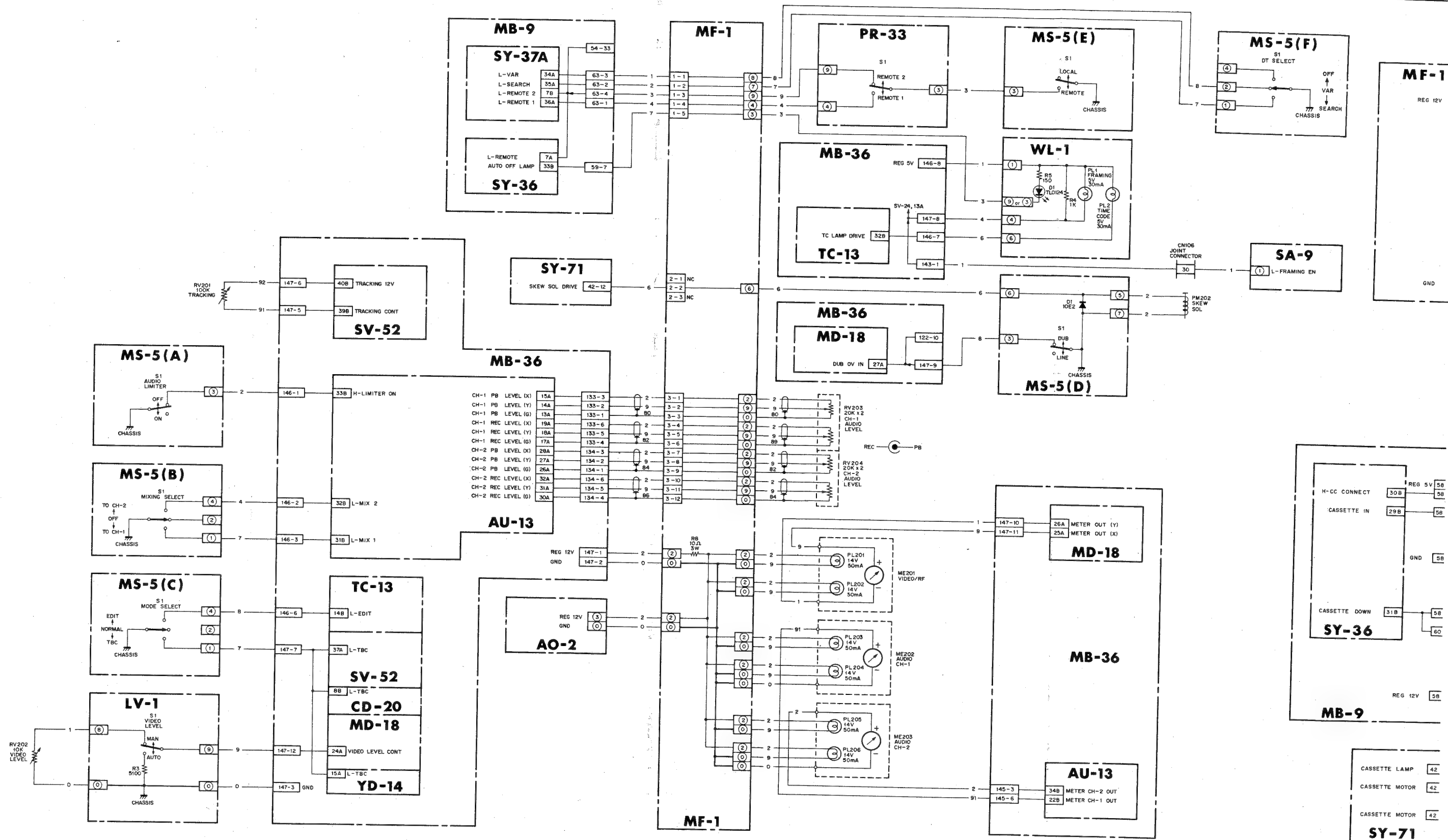


REF. NO	TYPE	PIN NO.	
IC 1	TC4510BP, MC14510BCP	16	8
IC 2	TC4510BP, MC14510BCP	16	8
IC 3	TC4510BP, MC14510BCP	16	8
IC 4	TC4510BP, MC14510BCP	16	8
IC 5	TC4510BP, MC14510BCP	16	8
IC 6	TC4510BP, MC14510BCP	16	8
IC 7	TC4510BP, MC14510BCP	16	8
IC 8	TC4023BP, CD4023BE	14	7
IC 9	TC4071BP, CD4071BE	14	7
IC 10	TC4069BP, CD4069BE	14	7
IC 11	TC4077BP, CD4077BE	14	7
IC 12	TC4027BP, CD4027BE	16	8
IC 13	TC4512BP, MC14512BCP	16	8
IC 14	TC4512BP, MC14512BCP	16	8
IC 15	TC4512BP, MC14512BCP	16	8
IC 16	TC4512BP, MC14512BCP	16	8
IC 17	TC4081BP, CD4081BE	14	7
IC 18	TC4073BP, CD4073BE	14	7
IC 19	TC4071BP, CD4071BE	14	7
IC 20	TC4519BP, MC14519BCP	16	8
IC 101	NJM4562D-M, NJM4562DOR	-	-
IC 102	CX130	8	2
IC 103	25C1963	-	-
IC 104	JPA76V-FA	-	-
IC 201	BX3915, BX3915A	-	2.8
IC 202	MC14539BCP	16	8
IC 203	TC4539BP, MC14539BCP	16	8
IC 204	TC4512BP, MC14512BCP	16	8
IC 205	TC4001BP, CD4001BE	14	7
IC 206	TC4011BP, CD4011BE	14	7
IC 207	TC4085BP, CD4085BE	14	7

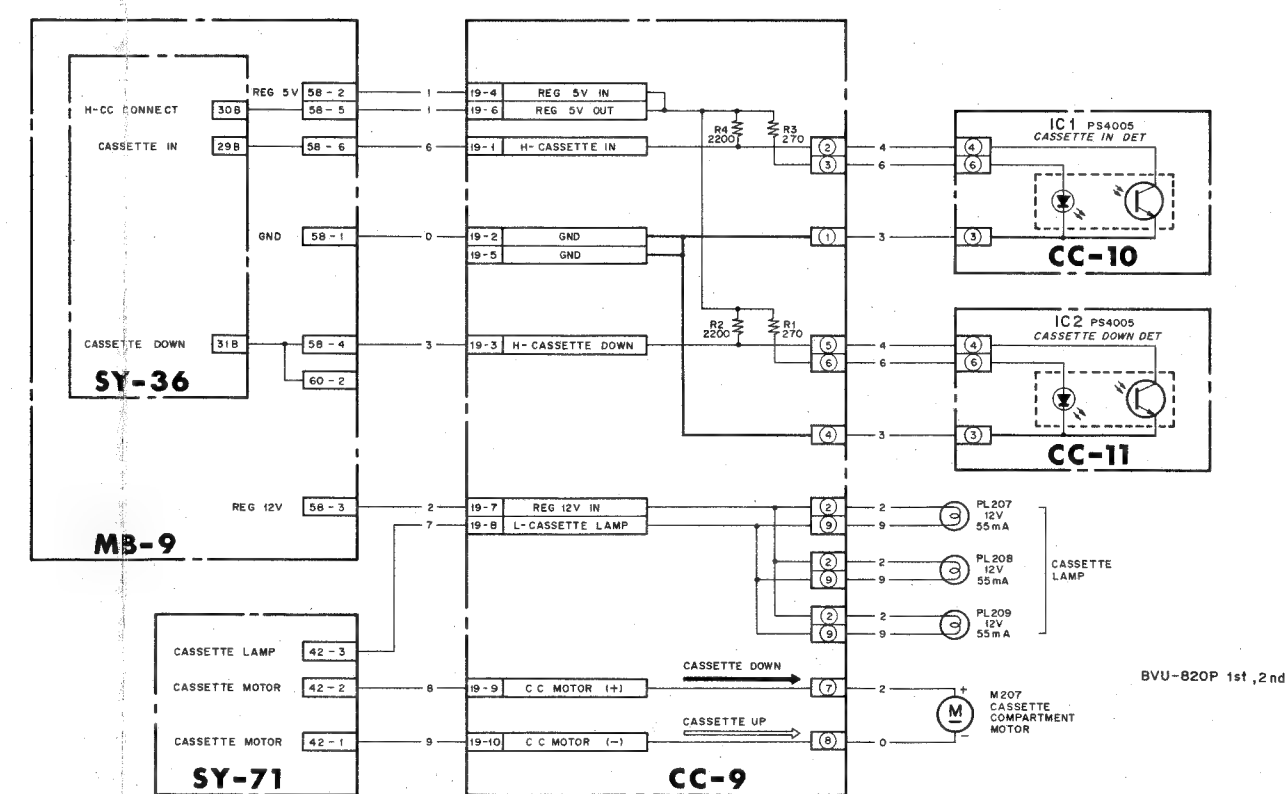
R19 1K	DATA 3	20A
R18 1K	DATA 2	19A
R17 1K	DATA 1	18A
R16 1K	DATA 0	17A
H-PLAY STS OUT		39A



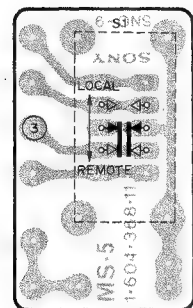
## — FRONT CHASSIS



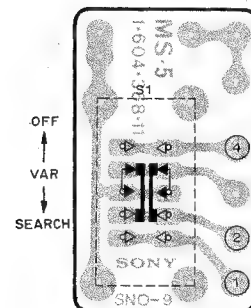




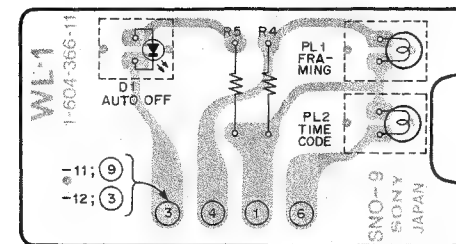




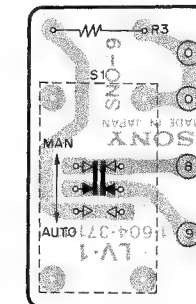
**MS-5(E)**  
- SOLDERING SIDE -  
1-604-368-11



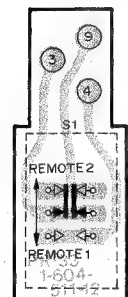
**MS-5(F)**  
- SOLDERING SIDE -  
1-604-368-11



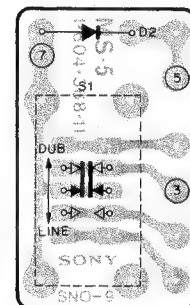
**WL-1** - SOLDERING SIDE -  
1-604-366-11,12



**LV-1**  
- SOLDERING SIDE -  
1-604-371-11

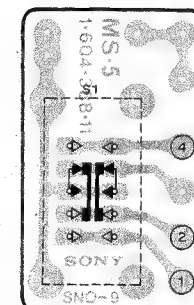


**PR-33**  
- SOLDERING SIDE -  
1-604-511-12

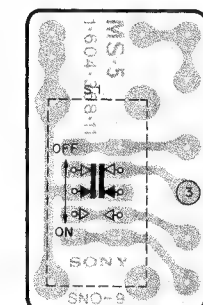


**MS-5(D)**  
- SOLDERING SIDE -  
1-604-368-11

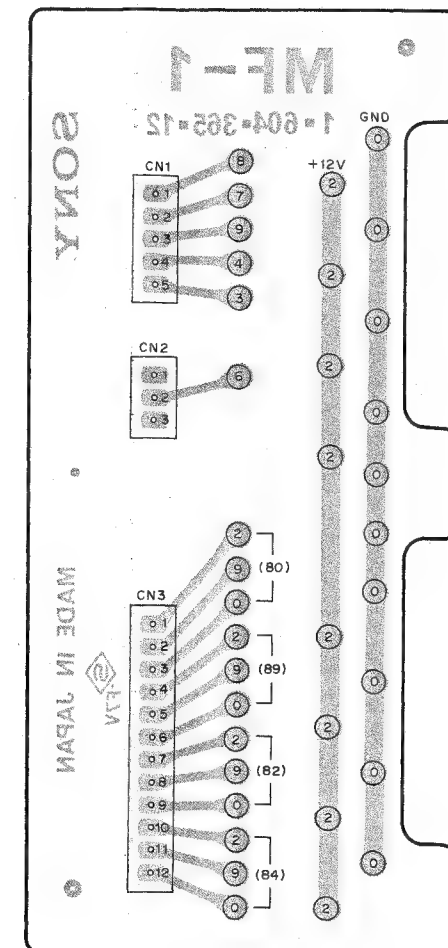
MS-5(C)	MS-5(B)
EDIT	TO CH-2
NORMAL	OFF
TBC	TO CH-1



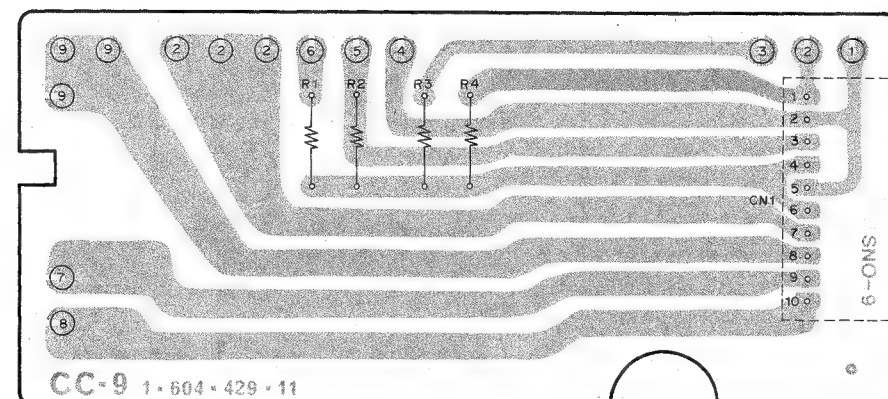
**MS-5(B)(C)**  
- SOLDERING SIDE -  
1-604-368-11



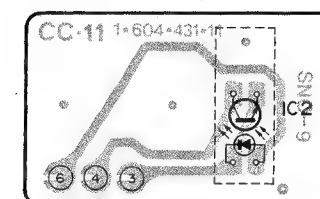
**MS-5(A)**  
- SOLDERING SIDE -  
1-604-368-11



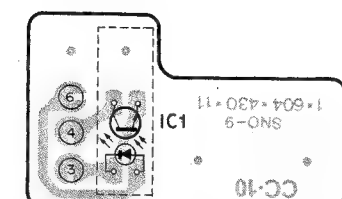
**MF-1** - COMPONENT SIDE -  
1-604-365-12,13



**CC-9** - SOLDERING SIDE -  
1-604-429-11,12

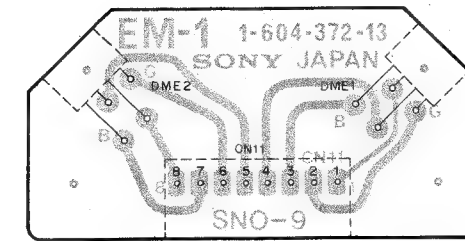


**CC-11** - SOLDERING SIDE -  
1-604-431-11,12

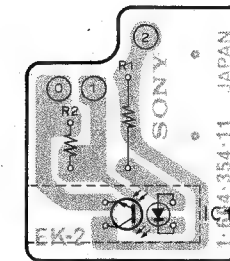


**CC-10** - SOLDERING SIDE -  
1-604-430-11,12  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM

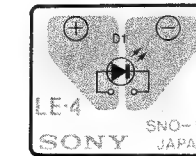




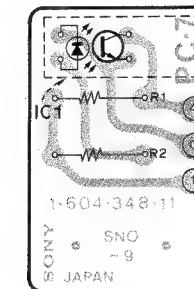
**EM-1** -SOLDERING SIDE-  
1-604-372-13



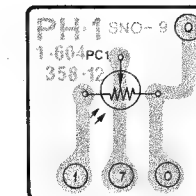
**EK-2**  
-SOLDERING SIDE-  
1-604-354-11,12



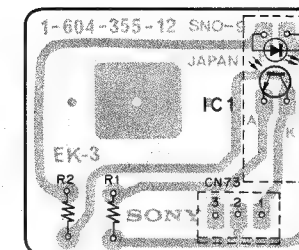
**LE-4**  
-SOLDERING SIDE-  
1-604-357-11



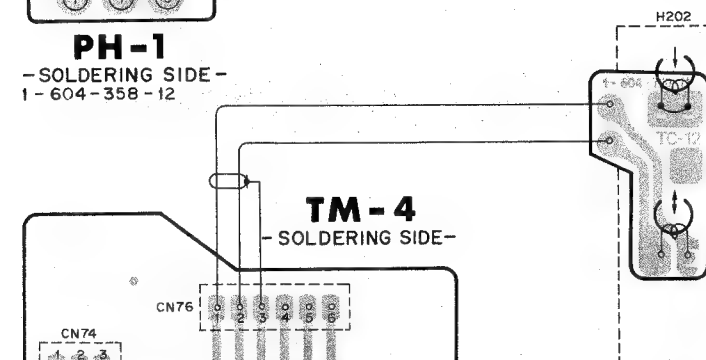
**PC-7**  
-SOLDERING SIDE-  
1-604-348-11



**PH-1**  
-SOLDERING SIDE-  
1-604-358-12

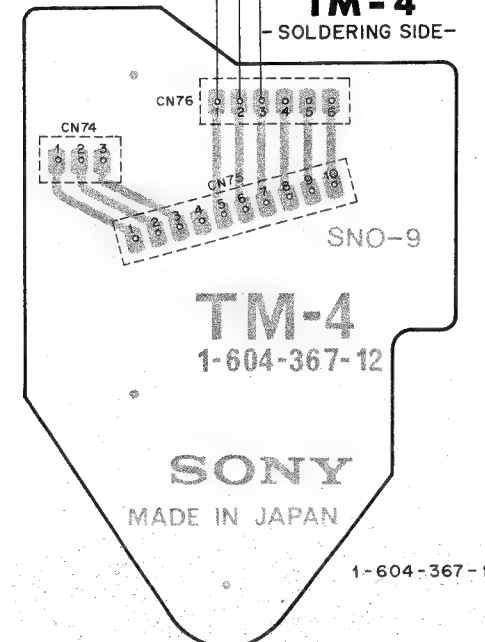


**EK-3**-SOLDERING SIDE-  
1-604-355-12



**TM-4**  
-SOLDERING SIDE-

**TC-12**  
-SOLDERING SIDE-  
1-604-760-11,12,13

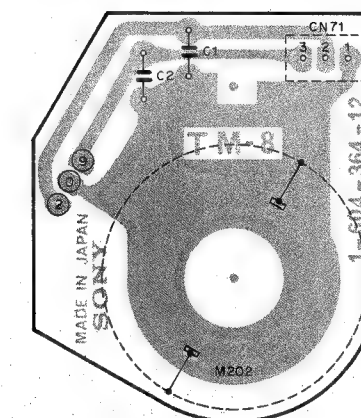


**TM-4**  
1-604-367-12

SONY  
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1-604-367-12

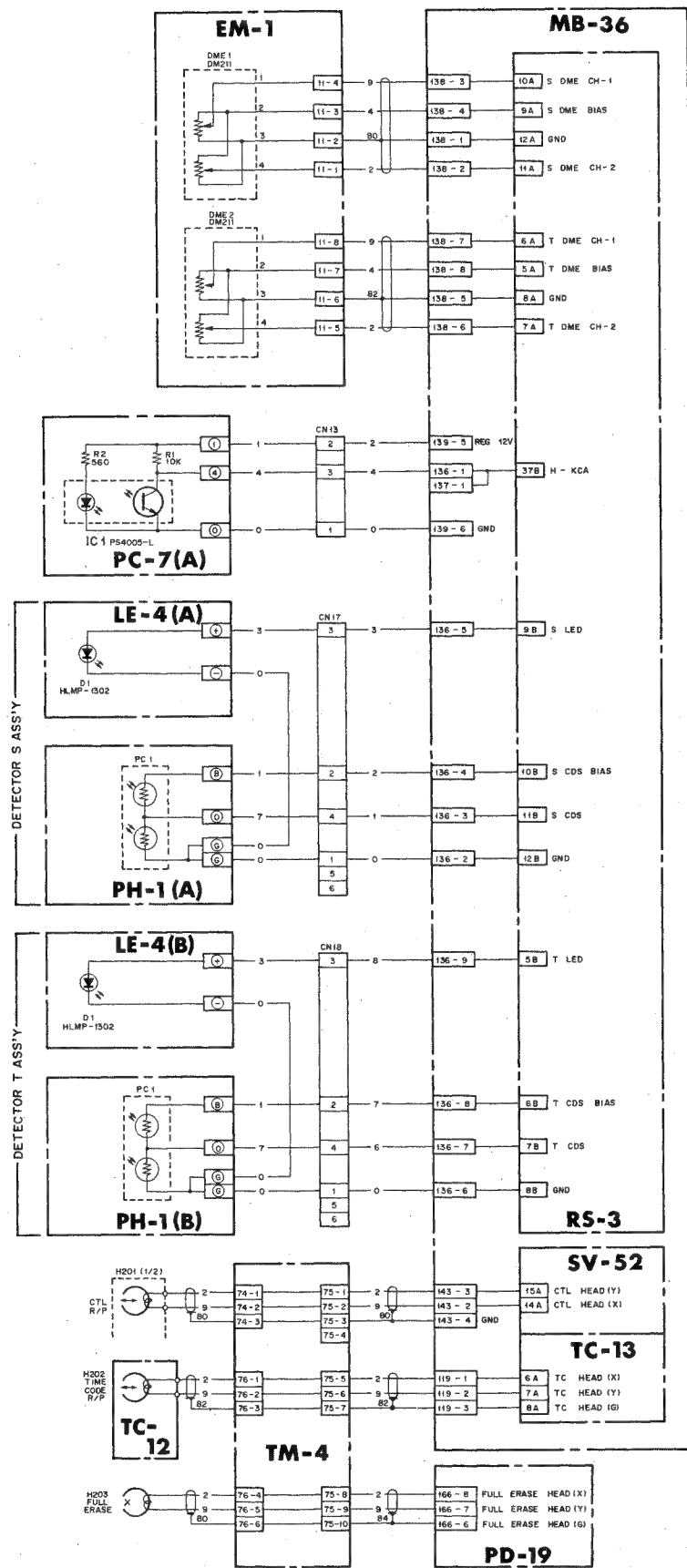
**TM-8** -SOLDERING SIDE-



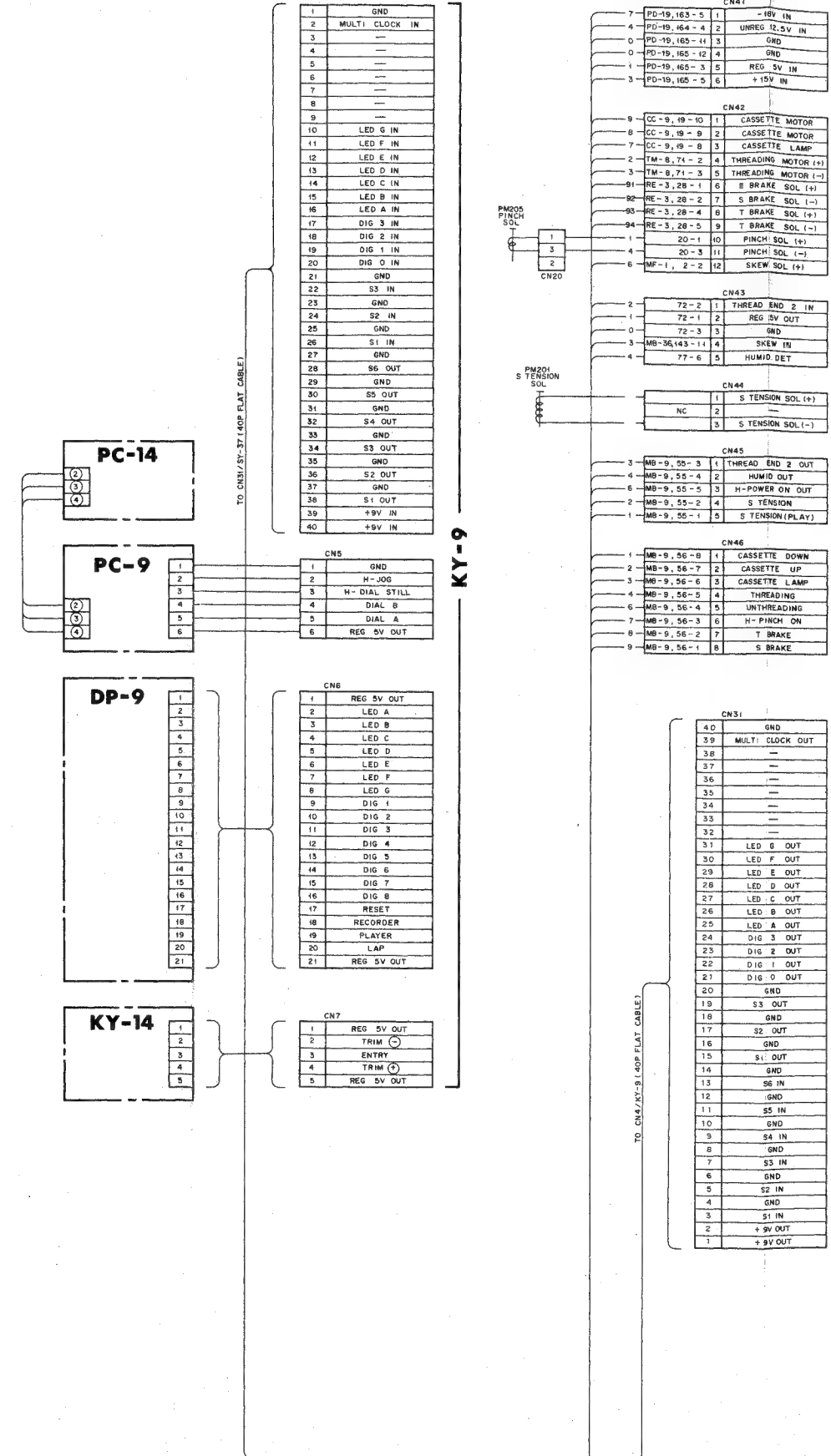
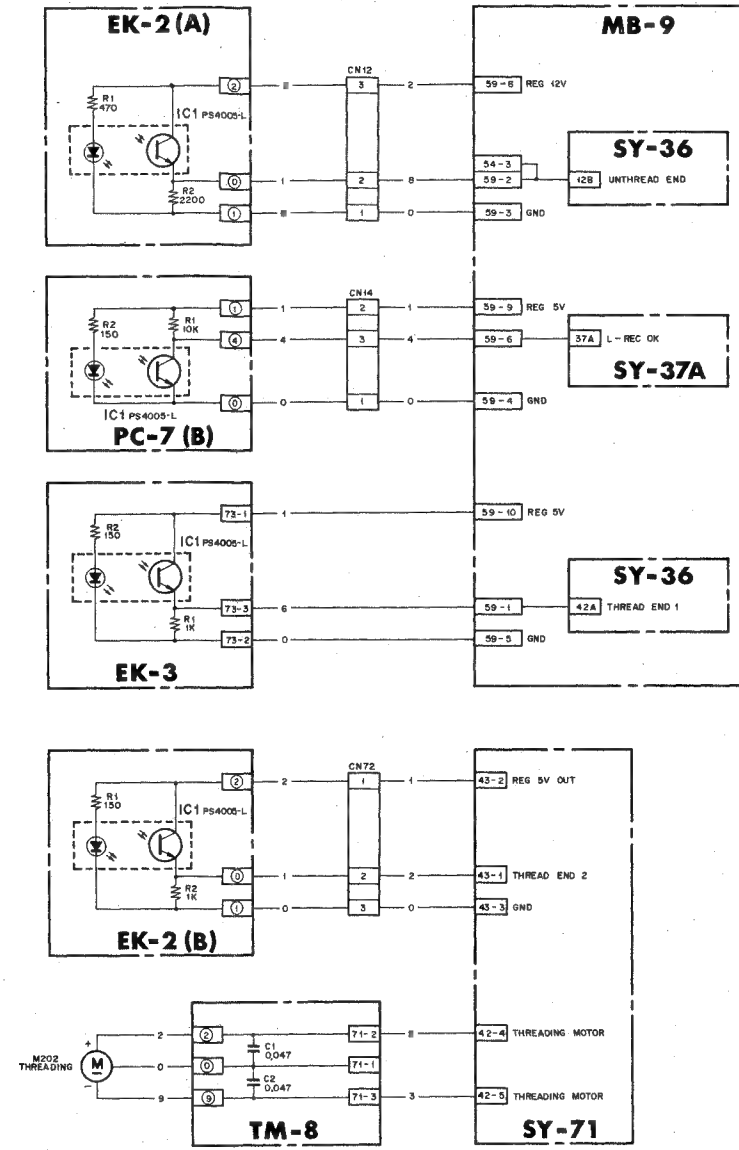
1-604-364-12,13,14  
BVU-820  
BVU-820P  
BVU-820S  
BVU-820PM



FRAME (2)

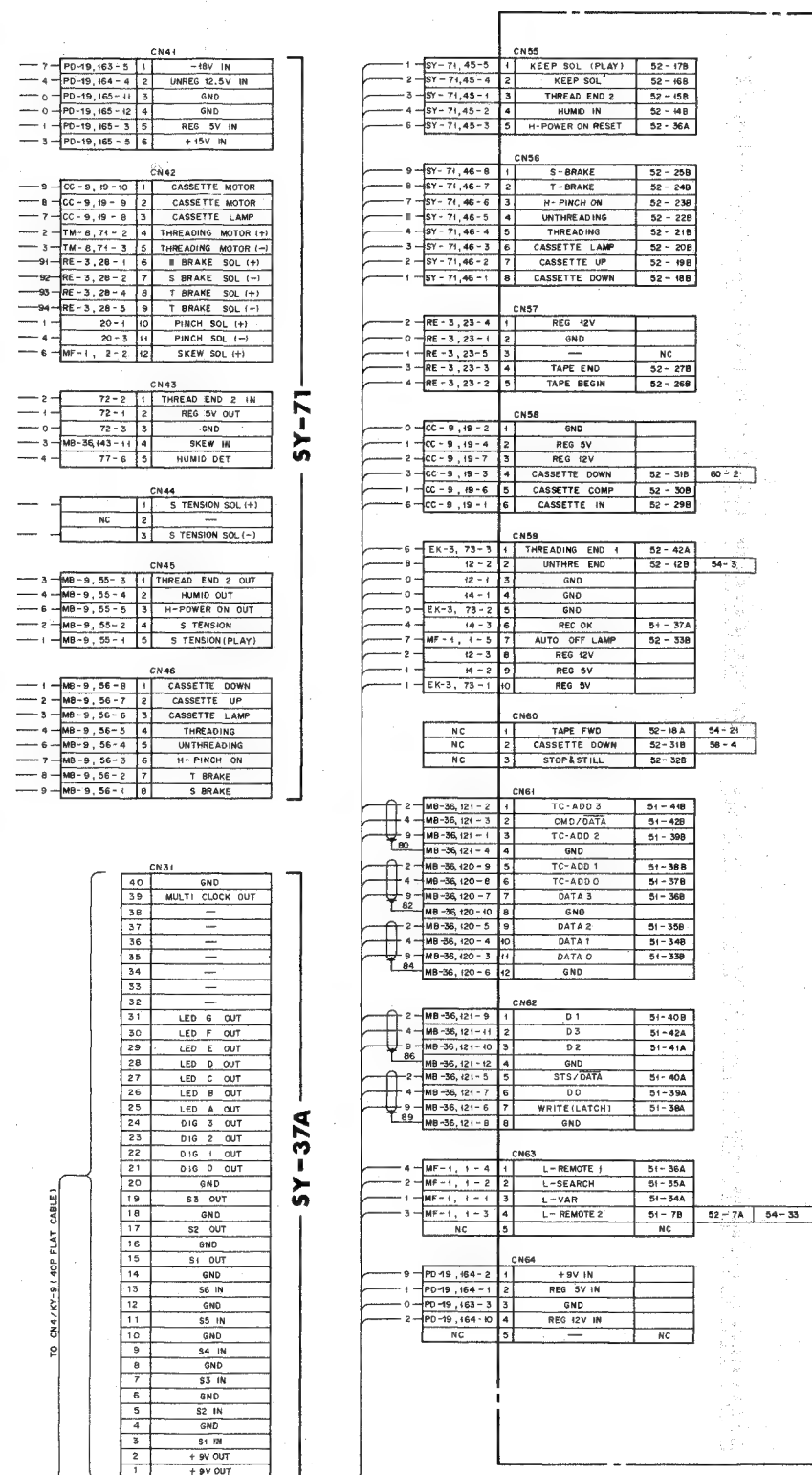


17-129



17-130







CN118			
1	JO CN, 106-4	1	CH-1 MIX
2	JO CN, 106-5	2	CH-2 MIX
3	JO CN, 106-2	3	EXT SYNC (G)
4	JO CN, 106-26	4	EXT SYNC (X)
5	JO CN, 106-31	5	EXT EN
6	JO CN, 106-10	6	TC OUT (G)
7	JO CN, 106-9	7	TC OUT (X)
8	JO CN, 106-49	8	TC IN (G)
9	JO CN, 106-49	9	TC IN (X)
10	JO CN, 106-39	10	EXT SC IN (G)
11	JO CN, 106-39	11	EXT SC IN (X)
12	PD-19, 166-5	12	FULL ERASE CONT
111-218 117-288			
CN119			
1	TM-4, 75-5	1	TC HEAD (X)
2	TM-4, 75-6	2	TC HEAD (Y)
3	TM-4, 75-7	3	TC HEAD (G)
CN120			
1	MB-36, OPEN	1	DATA 0
2	MB-36, OPEN	2	DATA 1
3	MB-36, OPEN	3	DATA 2
4	MB-36, OPEN	4	DATA 3
5	MB-36, OPEN	5	DATA 4
6	MB-36, OPEN	6	DATA 5
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272	MB-36, OPEN	272	DATA 271
273	MB-36, OPEN	273	DATA 272



(YD-14)

B		CN113		A	
REG 5V	2	REG 5V		REG 5V	
REG 12V	3	REG 12V		REG 12V	
+15V	4	+15V		+15V	
123-2	PB RF IN CH-A (X)	5	EE Y RF IN (X)	114-11B	
123-3	PB RF IN CH-B (X)	6	EE Y RF IN (G)	114-12B	
123-4	PB RF IN CH-C (X)	7	EE C RF IN (X)	114-13B	
123-5	PB RF IN CH-D (X)	8	EE C RF IN (G)	114-14B	
112-9A	L-COLOR IN	9	PB RF OUT (X)	114-15B	
112-10A	C RF OUT (X)	10	PB RF OUT (G)	114-16B	
112-11A	C RF OUT (G)	11	TBC DO PULSE OUT (X)	112-34A	124-8 149-1
112-12A	TC GATE OUT	12	TBC DO PULSE OUT (G)	124-7	149-3
112-13A	DLD SW PULSE IN	13	Y DUB OUT (X)	128-1	
112-14A	PILOT BURST GATE	14	Y DUB OUT (G)	128-2	
124-6	L-FF/REW	15	L TBC EN IN	112-28B	147-7 117-37A
112-16A	SYNC Y OUT (X)	16	NC		
112-17A	SYNC Y OUT (G)	17	G BAND PULSE OUT	112-18A	
124-5	H-DT SW ON	18	NC		
112-28B	H-DT ON IN	19	H-CONF IN	117-6A	112-7A 114-26B 124-2
112-29A	H-CONF IN	20	NC		
NC		21	NC		
NC		22	NC		
NC		23	NC		
NC		24	NC		
NC		25	NC		
NC		26	NC		
NC		27	NC		
NC		28	NC		
NC		29	NC		
NC		30	NC		
NC		31	L-SERVO LOCK IN	112-31A	117-15B 141-4 142-36
NC		32	NC		
NC		33	AUDIO REC 12V IN	115-46B	142-25
NC		34	NC		
NC		35	NC		
112-36A	DEMOD Y OUT (X)	36	NC		
112-37A	DEMOD Y OUT (G)	37	NC		
112-38A	EE 12V IN	38	EE 12V IN	NC	
112-39A	BLK PULSE IN	39	NC		
NC		40	NC		
NC		41	NC		
REG -12V	42	REG -12V			
GND	43	GND			

(MD-18)

B		CN114		A	
REG 5V	2	REG 5V		REG 5V	
REG 12V	3	REG 12V		REG 12V	
+15V	4	+15V		+15V	
NC		5	LINE IN (X)	127-1	
NC		6	LINE IN (G)	127-2	
NC		7	Y-DUB IN (X)	127-3	
NC		8	Y-DUB IN (G)	127-4	
NC		9	C-DUB IN (X)	127-5	
NC		10	C-DUB IN (G)	127-6	
113-5A	EE Y-RF OUT (X)	11	REC Y-RF OUT (X)	127-7	
113-6A	EE Y-RF OUT (G)	12	REC Y-RF OUT (G)	127-8	
113-7A	EE CHROMA OUT (X)	13	REC CHROMA OUT (X)	127-9	
113-8A	EE CHROMA OUT (G)	14	REC CHROMA OUT (G)	127-10	
113-9A	PB RF IN	15	NC		
113-10A	PB RF IN	16	NC		
NC		17	NC		
NC		18	NC		
NC		19	NC		
NC		20	NC		
112-19A	PB 5.24MHz OUT (X)	21	OFF TAPE RF OUT (X)	128-3	
112-20A	PB 5.24MHz OUT (G)	22	OFF TAPE RF OUT (G)	128-4	
124-1	DT ENVELOPE OUT	23	NC		
NC		24	VIDEO LEVEL CONT	147-12	
NC		25	METER OUT (X)	147-11	
117-6A	H-CONF IN	26	METER OUT (Y)	147-10	
111-13A	SYNC OUT (X)	27	DUB EN IN	147-9	
111-14A	SYNC OUT (G)	28	NC		
NC		29	NC		
111-40A	L-TC DIS IN	30	DUB EN OUT	122-10	
117-7A	H-RE EN IN	31	NC		
117-8A	PG A IN	32	RE MUTE B OUT	126-7	
117-9A	H-VIDEO REC IN	33	RE MUTE A OUT	126-8	
117-10A	PHASE PG IN	34	REC B OUT	126-6	
NC		35	REC A OUT	126-5	
117-11A	H-VIDEO REC/EE IN	36	L-REC EN OUT	126-4	
NC		37	H-VIDEO EE OUT	112-33A	
NC		38	NC		
124-4	SW PULSE OUT	39	NC		
117-12A	SW PULSE IN	40	REF BURST PULSE OUT	128-5	
NC		41	NC		
REG -12V	42	REG -12V			
GND	43	GND			

(AU-13)

B		CN115		A	
REG 5V	2	REG 5V		REG 5V	
REG 12V	3	REG 12V		REG 12V	
+15V	4	+15V		+15V	
NC		5	AUDIO HEAD CH-1 (X)	132-1	
NC		6	AUDIO HEAD CH-1 (Y)	132-2	
NC		7	AUDIO HEAD CH-1 (G)	132-3	
NC		8	NC		
NC		9	AUDIO HEAD CH-2 (X)	132-4	
NC		10	AUDIO HEAD CH-2 (Y)	132-5	
NC		11	AUDIO HEAD CH-2 (G)	132-6	
130-1	CH-1 MIC IN (G)	12	NC		
130-2	CH-1 MIC IN (Y)	13	CH-1 PB LEVEL (G)	133-1	
130-3	CH-1 MIC IN (X)	14	CH-1 PB LEVEL (Y)	133-2	
NC		15	CH-1 PB LEVEL (X)	133-3	
113-35A	AUDIO REC	16	NC		
142-27	INS-1EE	17	CH-1 REC LEVEL (G)	133-4	
142-28	INS-2 EE	18	CH-1 REC LEVEL (Y)	133-5	
142-35	ASSEMBLE EE	19	CH-1 REC LEVEL (X)	133-6	
116-16B	H-STOP	20	NC		
111-33A	FULL ERASE CONT	21	LINE CH-1 OUT (X)	133-7	
143-6	METER CH-1 OUT	22	LINE CH-1 OUT (G)	133-8	
NC		23	NC		
143-5	HEADPHONE CH-1 (X)	24	NC		
143-4	HEADPHONE CH-1 (G)	25	NC		
NC		26	CH-2 PB LEVEL (G)	134-1	
131-1	CH-2 MIC IN (X)	27	CH-2 PB LEVEL (Y)	134-2	
131-2	CH-2 MIC IN (Y)	28	CH-2 PB LEVEL (X)	134-3	
131-3	CH-2 MIC IN (G)	29	NC		
NC		30	CH-2 REC LEVEL (G)	134-4	
146-3	MIX-1	31	CH-2 REC LEVEL (Y)	134-5	
146-2	MIX-2	32	CH-2 REC LEVEL (X)	134-6	
146-1	H-LIMITER ON	33	NC		
145-3	METER CH-2 OUT	34	LINE CH-2 OUT (X)	134-7	
145-2	HEADPHONE CH-2 (X)	35	LINE CH-2 OUT (G)	134-8	
145-1	HEADPHONE CH-2 (G)	36	NC		
NC		37	NC		
NC		38	NC		
135-1	CH-2 ERASE HEAD (G)	39	CH-1 ERASE HEAD (X)	135-4	
135-2	CH-2 ERASE HEAD (Y)	40	CH-1 ERASE HEAD (Y)	135-5	
135-3	CH-2 ERASE HEAD (X)	41	CH-1 ERASE HEAD (G)	135-6	
REG -12V	42	REG -12V			
GND	43	GND			

(RS-3)

B		CN116		A	
REG 5V	2	REG 5V		REG 5V	
REG 12V	3	REG 12V		REG 12V	
+15V	4	+15V		+15V	
136-9	T LED	5	T DME BIAS	136-8	
136-8	T CDS BIAS	6	T DME CH-1	136-7	
136-7	T CDS	7	T DME CH-2	136-6	
136-6	T GND	8	T DME GND	136-5	
136-5	S LED	9	S DME BIAS	136-4	
136-4	S CDS BIAS	10	S DME CH-1	136-3	
136-3	S CDS	11	S DME CH-2	136-2	
136-2	S GND	12	S DME GND	136-1	
NC		13	T MOTOR ERROR	135-7	
NC		14	S MOTOR ERROR	135-12	
NC		15	T CURRENT	135-11	
115-20B	H-STOP M	16	T CURRENT GND	135-10	
NC		17	S CURRENT	135-9	
NC		18	S CURRENT GND	135-8	
NC		19	MULTI CLOCK	117-7B	142-32
NC		20	H-UNTH END	142-3	
NC		21	L-POWER ON	142-4	
142-11	H-TM OFF	22	H-X10 FWD	112-32A	117-41B
142-13	RS MULTI 1	23	NC		
142-14	H-SW OFF	24	NC		
142-15	H-FUNC EN	25	NC		
142-16	RS MULTI 2	26	NC		
142-17	H-MECH BRAKE	27	NC		
142-18	L-TAPE PROTECT	28	NC		
142-19	L-THRE MOTOR DIS	29	H-DT ON IN	112-28B	113-19B 124-3
142-20	H-THRE DIS	30	NC		
NC		31	CTL PULSE	117-31B	141-8
NC		32	L-REEL STOP	117-32B	
NC		33	H-REEL FWD	117-33B	142-22
NC		34	H-CAP FWD	117-34B	
NC		35	H-CAP STILL	117-35B	142-5
NC		36	H-CAP ROT	117-36B	
136-1	137-1	37	CAP SPEED	117-37B	
NC		38	1/2 VD	117-38B	
137-4	S PG PULSE	39	NC		
NC		40	NC		
-18V	41	-18V			
REG -12V	42	REG -12V			
GND	43	GND			

(SV-52)

B		CN117		A	
REG 5V	2	REG 5V		REG 5V	
REG 12V	3	REG 12V		REG 12V	
+15V	4	+15V		+15V	
124-9	H-SW DL CONT	4	INPUT VIDEO DET	111-40A	
142-6	PINCH ON (DT)	5	PB SYNC IN	112-28A	
116-19A	MULTI 2 IN	6	H-CONF OUT	114-26B	124-2 112-7A 113-19A
142-32	MULTI CLOCK IN	7	RE EN OUT	114-31B	
142-10	H-DRUM ROTATE OUT	8	SPEED PG (A) OUT	114-32B	
142-12	P/S	9	V REC	114-33B	111-37B
142-24	L-C12	10	PHASE PG OUT	114-34B	
142-26	SERVO CMD IN	11	V REC/EE OUT	114-36B	
142-9	SERVO EN IN	12	SW PULSE OUT	114-40B	151-4
142-33	L-REMOTE IN	13	L-FRAMING EN IN	143-1	147-8
142-30	MULTI 1 IN	14	CTL HEAD (X)	143-2	
142-36	L-SERVO LOCK OUT	15	CTL HEAD (Y)	143-3	
111-39B	NC	16	CTL HEAD (G)	143-4	
142-34	COLOR FRAMED OUT	17	PHASE PS IN	143-5	
142-2	L-STANDBY IN	18	GND		
142-37	1/2 VD OUT	19	SPEED PG (A) IN	143-7	
143-11	SKREW	20	SPEED PG (B) IN	143-9	
151-5	NORMAL FWD A	21	DME 12V OUT	144-1	
146-6	EDT EN	22	DME A IN	144-2	
112-40A	VD	23	DME B IN	144-3	
112-35A	V BLK PULSE	24	DME GND	144-4	
112-39B	TAPE FWD OUT	25	CAPSTAN ERROR (X)	144-5	
111-35B	CTL COUNT PULSE OUT	26	CAPSTAN ERROR (G)	144-6	
111-34B	NORMAL FWD PB	27	CAPSTAN POLA	144-7	
111-33B	H-PINCH ON IN	28	DRUM ERROR	144-8	
141-6	H-DT	29	DRUM CURRENT	144-9	
150-3	PG (B) OUT	30	PB BURST PULSE IN	144-10	
116-31A	CTL PULSE OUT	31	REF SYNC IN	144-11	111-41B
116-32A	H-REEL STOP IN	32	REF BURST PULSE IN	144-12	
142-22	116-35A	33	DUB 1st FIELD IN	114-38A	
142-5	116-34A	34	LINE/DUB SW	114-38A	
116-36A	L-CAP SLOW OUT	35	SYNCHRONIZE IN	126-3	
116-37A	CAPSTAN SPEED	37	L-TBC EN IN	112-8B	147-7 113-15A
116-38A	1/2 VD OUT	38	FG (A) OUT	150-5	
147-5	TRACKING CONT	39	L-CAPSTAN LOCK	126-2	
147-6	TRACKING 12V OUT	40	L-DRUM LOCK OUT	126-1	124-10
112-32A	H-X10 IN	41	DUB 1st FIELD OUT	112-24A	
REG -12V	42	REG -12V			
GND	43	GND			

NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
1	CONNECTED (CD-20 CN112-25B) (SV-52 CN117-10B)	10501~

NOTE: ○ IS CONNECTED TO FC-10 BOARD

MB-36

BUV-820P 1st, 2nd



FRAME (4)

NOTE

MARK	CHANGE INFORMATION	SERIAL NO.
PD-19	CHANGE INFORMATION	10651~ (PAL)
PD-19	ADD	10051~ (SECAM)
PD-19	DELETE	11251~ (PAL)
PD-19	DELETE	10061~ (SECAM)
PD-19	DELETE	11251~ (PAL)
PD-19	DELETE	10061~ (SECAM)

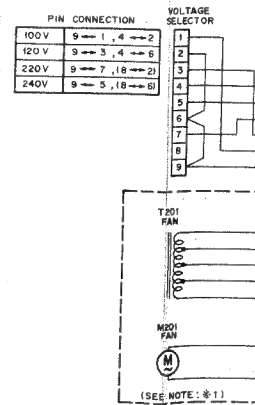
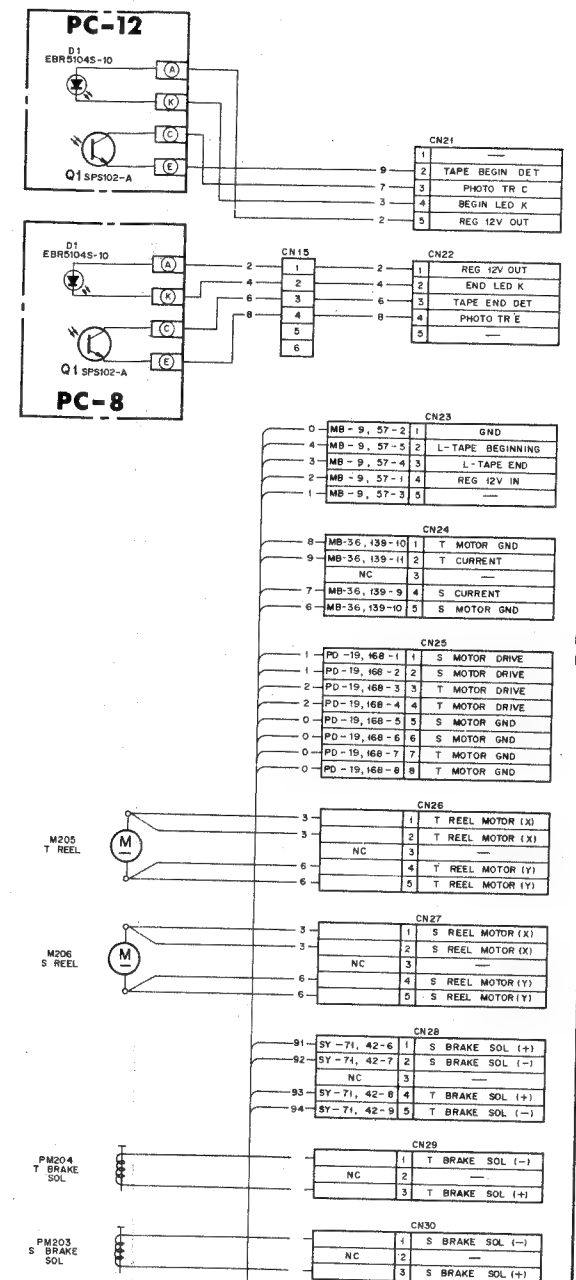
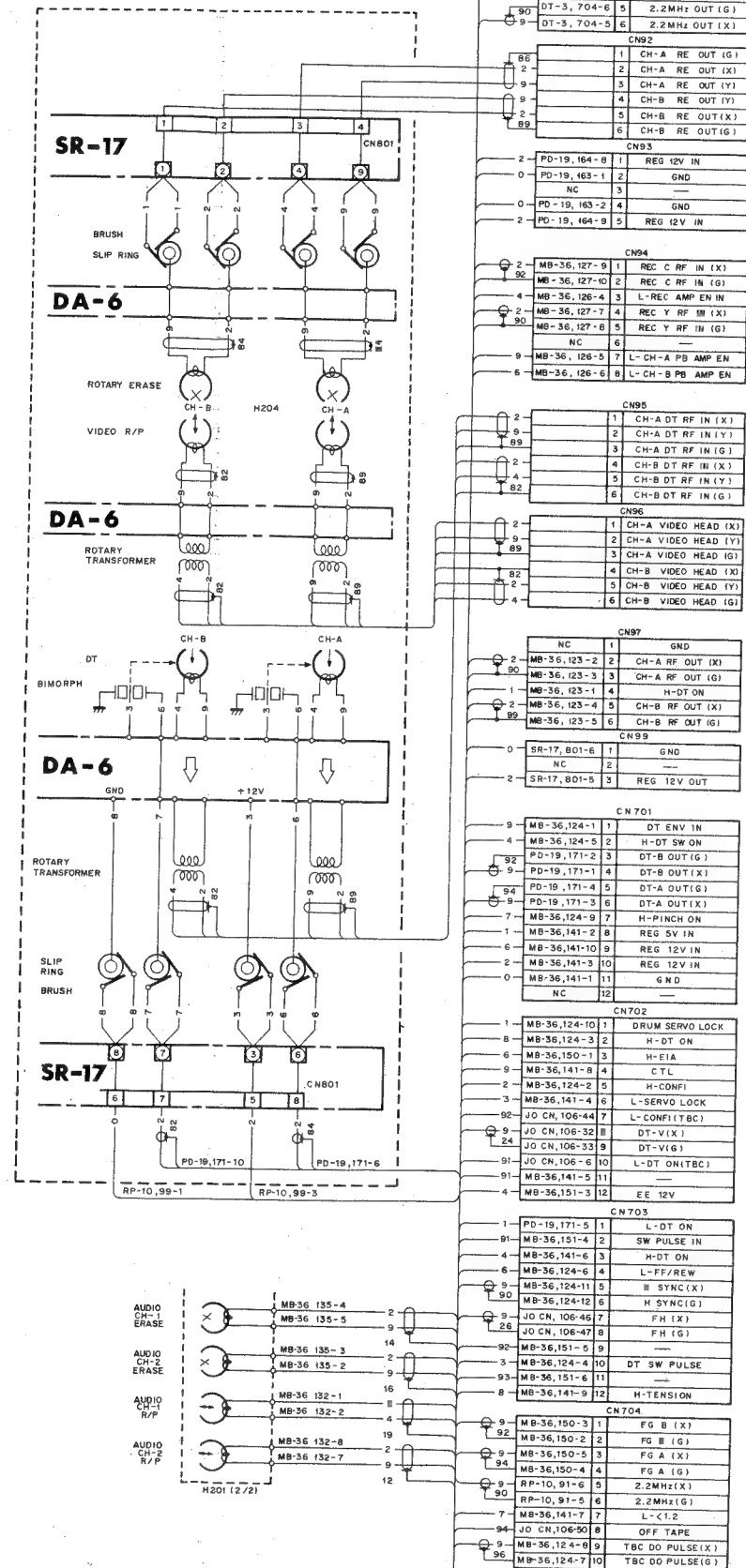
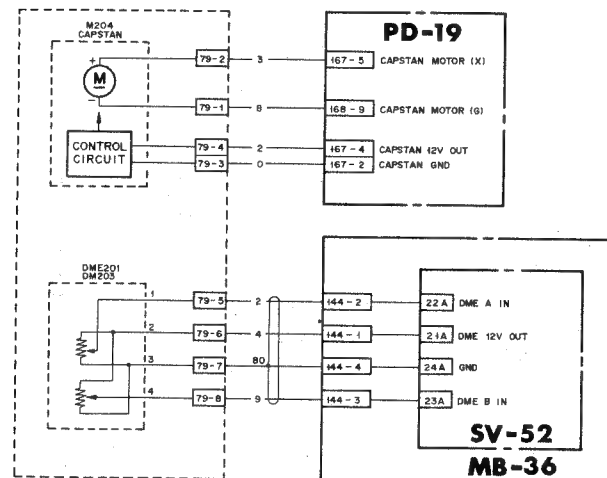
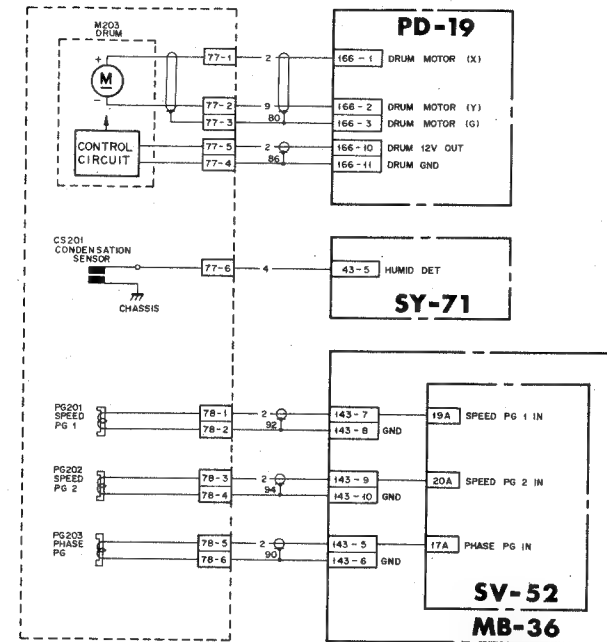
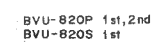





Figure 1. The effect of the concentration of the solution on the rate of the reaction.

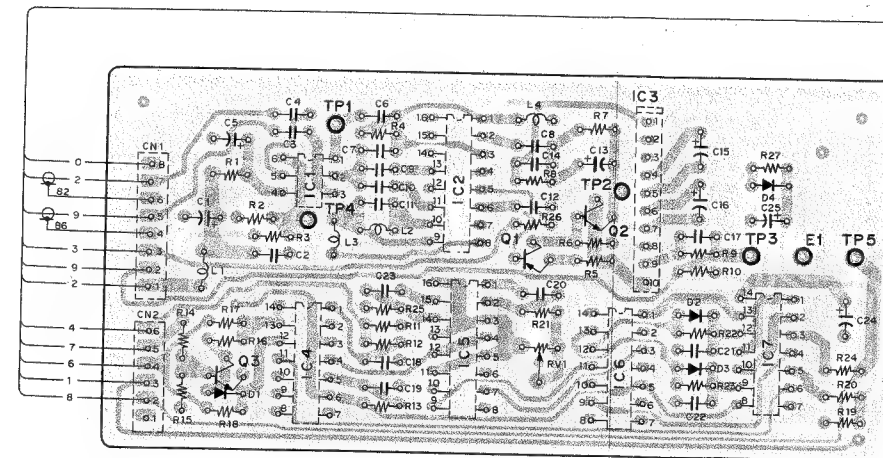


**NOTE:**

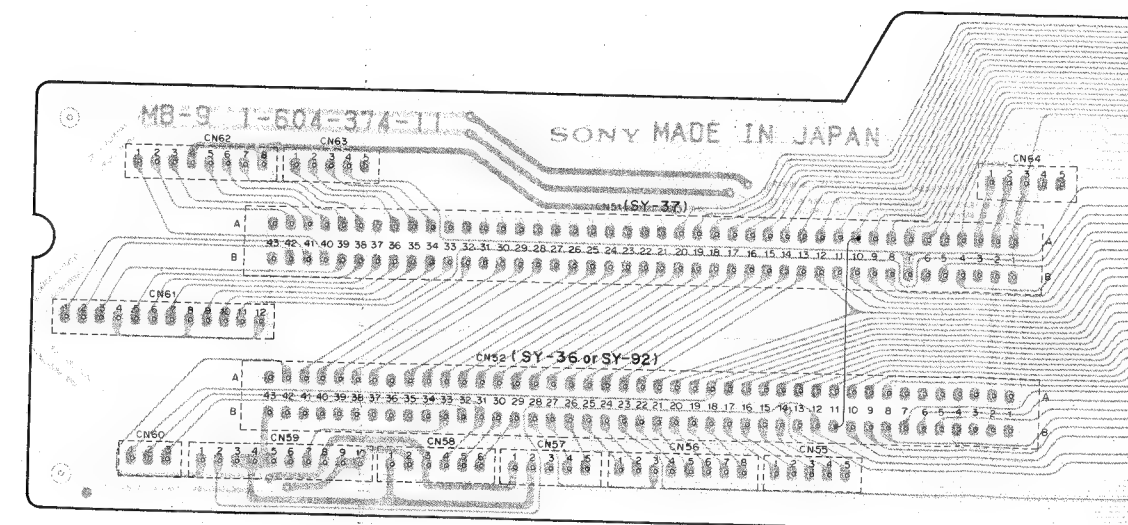
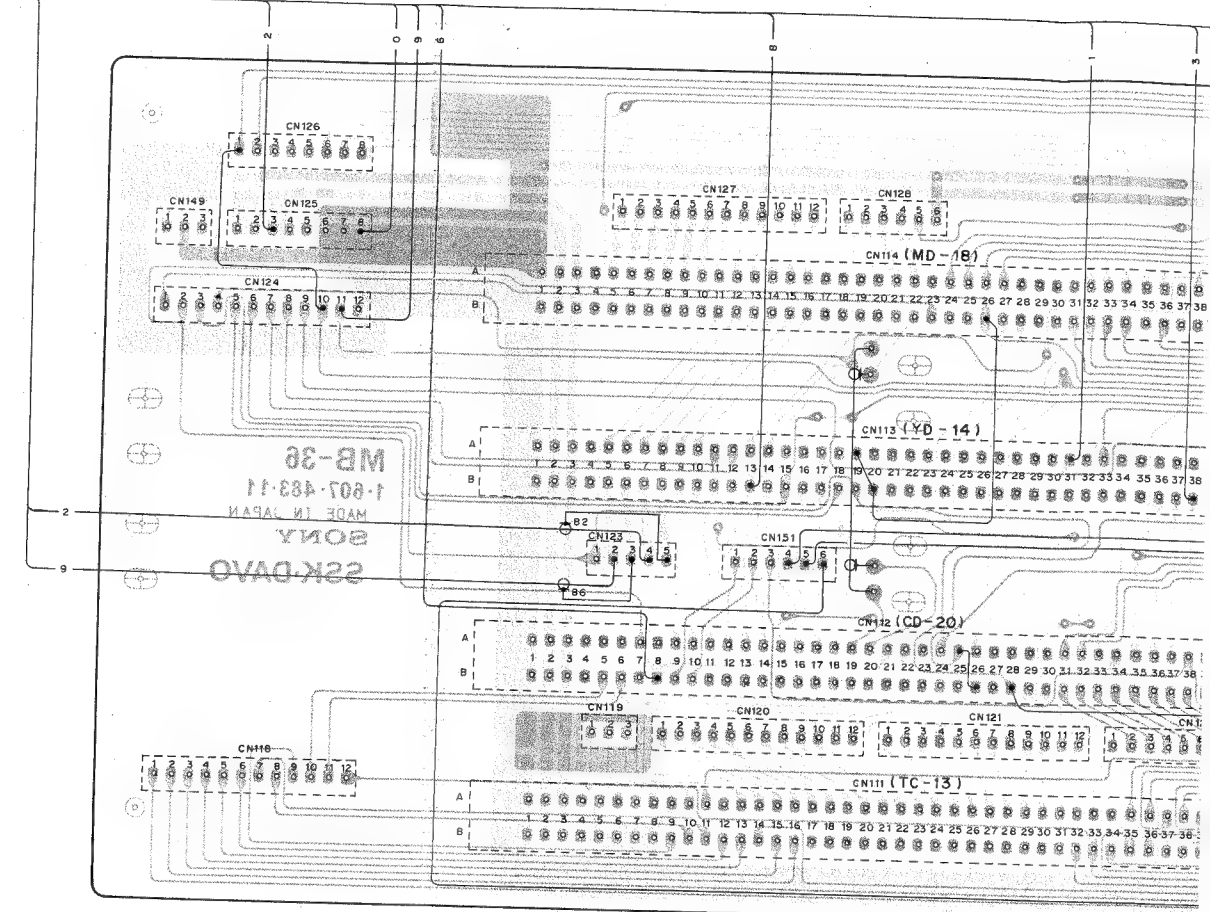
The shaded and -marked components are critical to safety.  
Replace only with same components as specified.



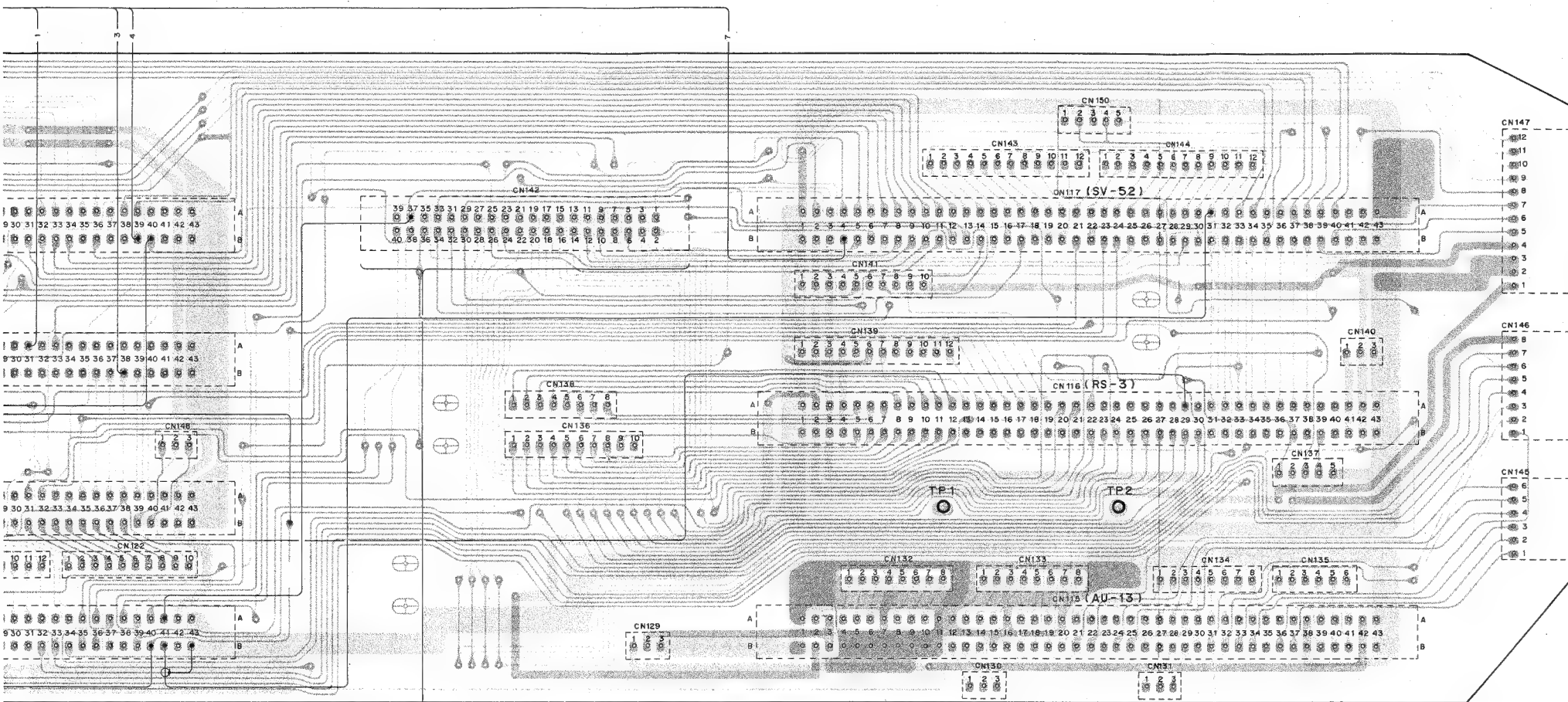
Serial No. Up to 10500



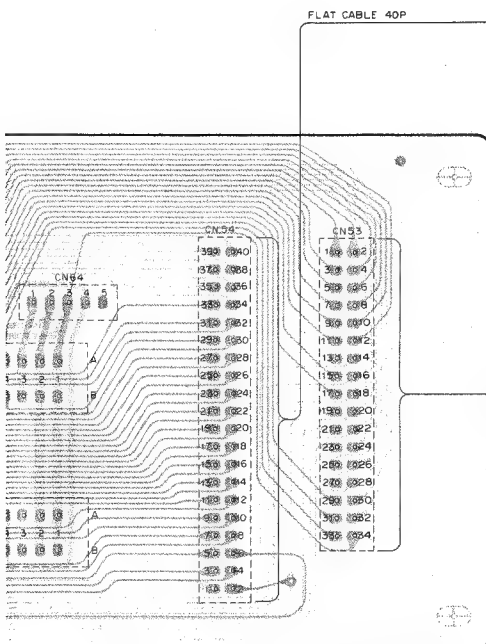
FC-10-SOLDERING SIDE-  
1-609-605-12



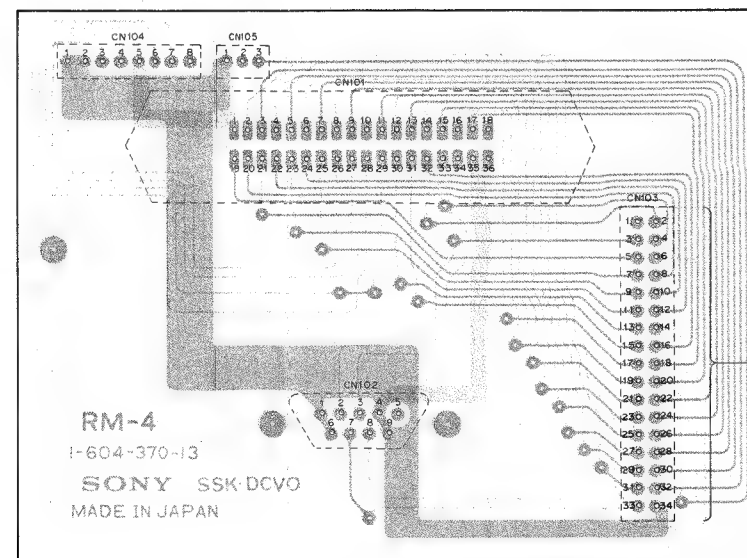




**MB-36-1** - COMPONENT SIDE -  
1-607-483-11  
BVU - 820P (S/N. 10301~10500)



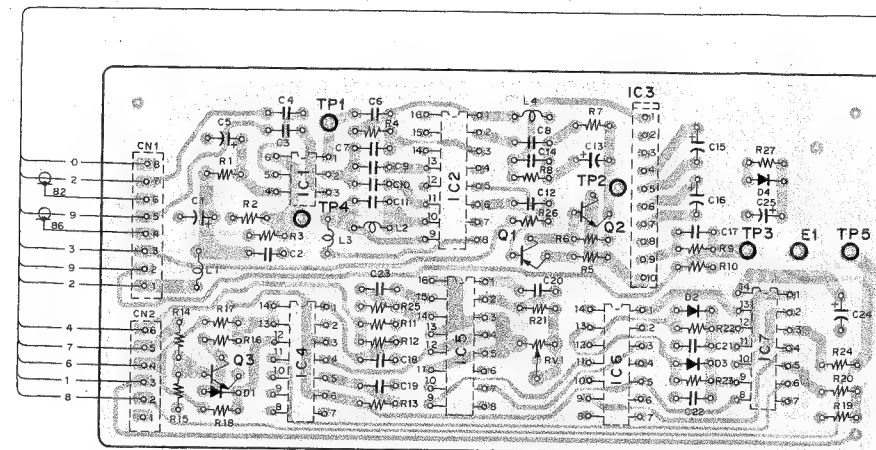
**MB-9** - SOLDERING SIDE -  
1-604-374-11



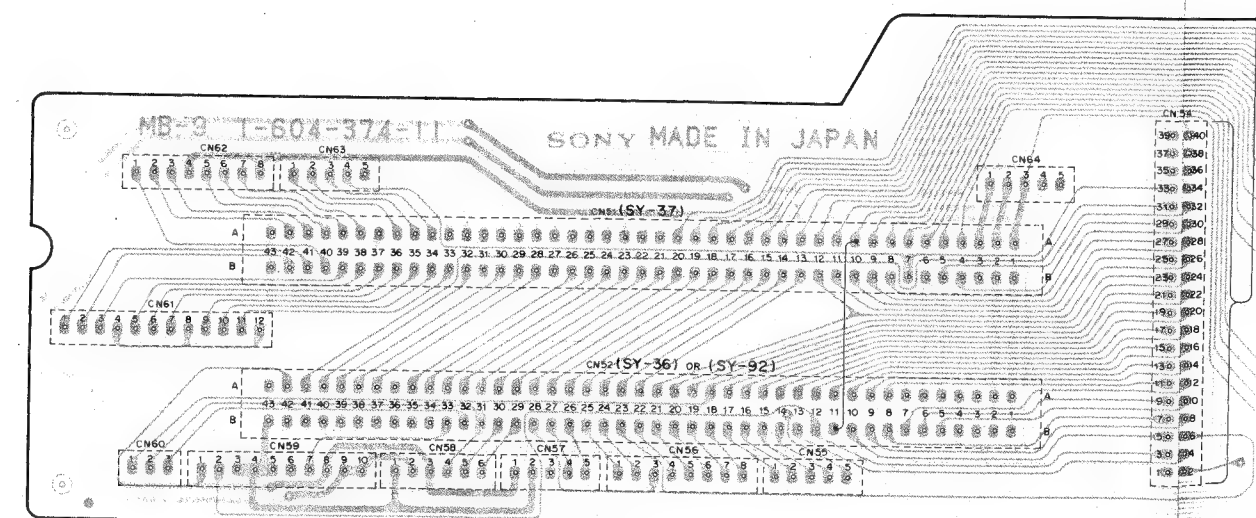
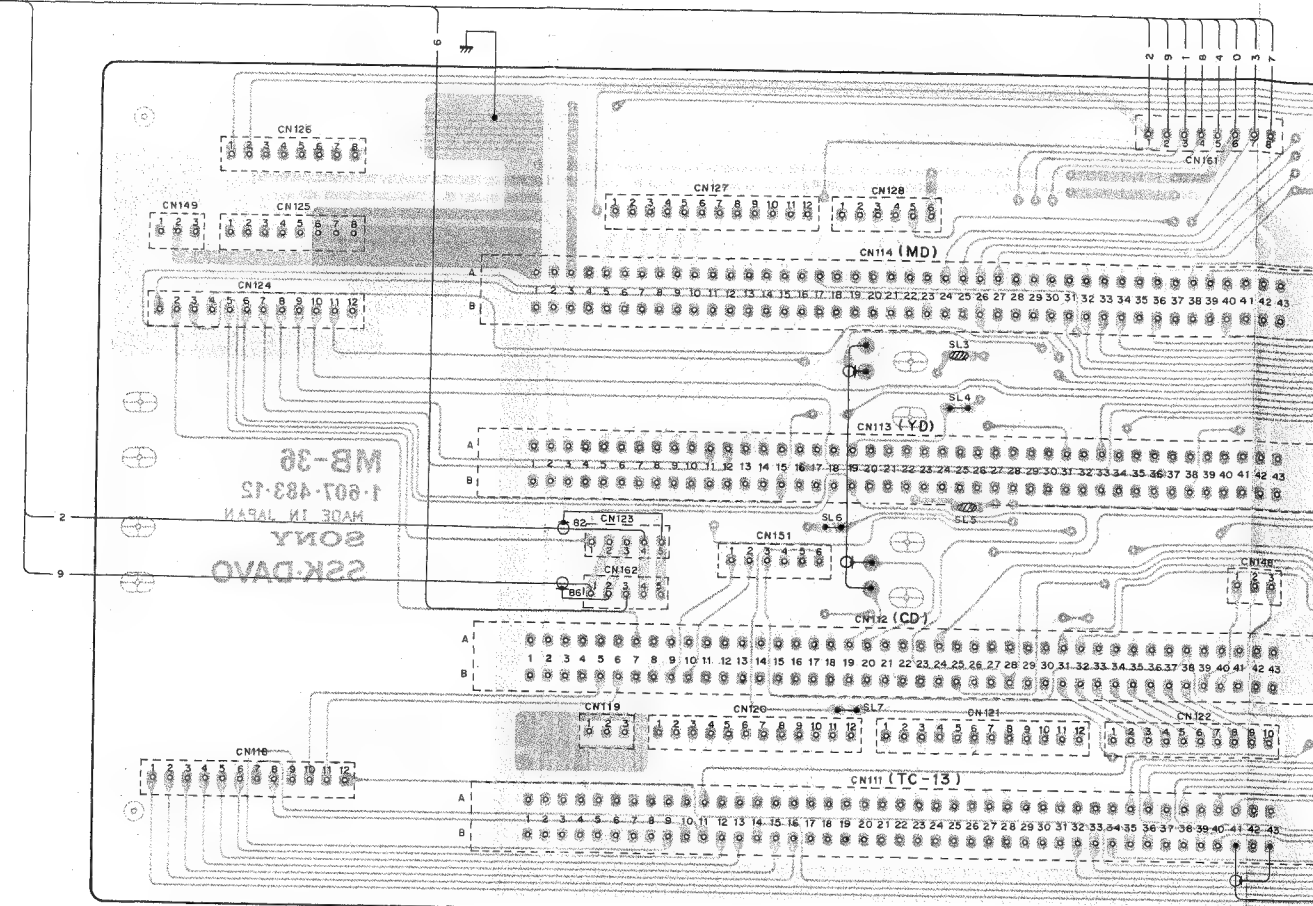
**RM-4** - SOLDERING SIDE -  
1-604-370-13



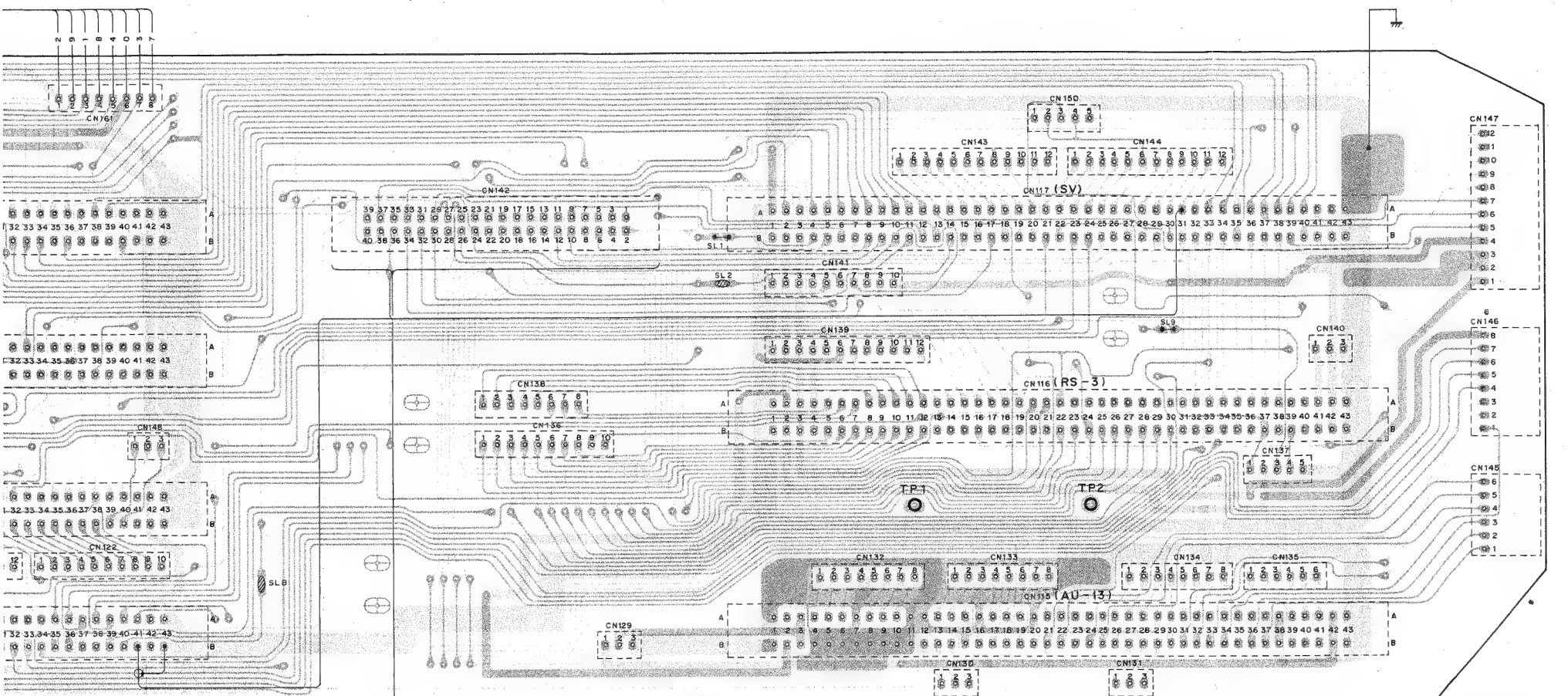
Serial No. 10501 and higher



**FC-10-SOLDERING SIDE-**  
1-609-605-12  
S/N. 10646~(U/C)  
S/N. 10201~(J)  
S/N. 10006~(PM)  
S/N. 10301~(PAL)  
S/N. 10051~(SECAM)







NOTE: •SL=SLIT  
•SL2,SL3,SL5,SL6  
(SHORT=NTSC/PM  
OPEN=PAL/SECAM)  
•SL1,SL4,SL6,SL7,SL9  
(SHORT=PAL/SECAM  
OPEN=NTSC/PM)

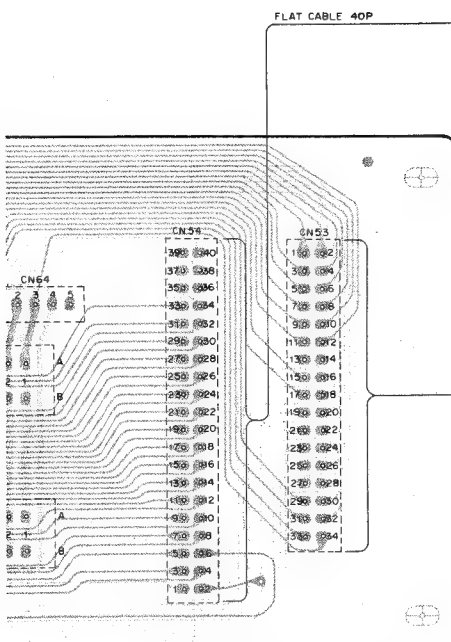
# **MB-36-1**

BVU-B20P(S/N.10501~)  
BVU-B20S(S/N.10051~)

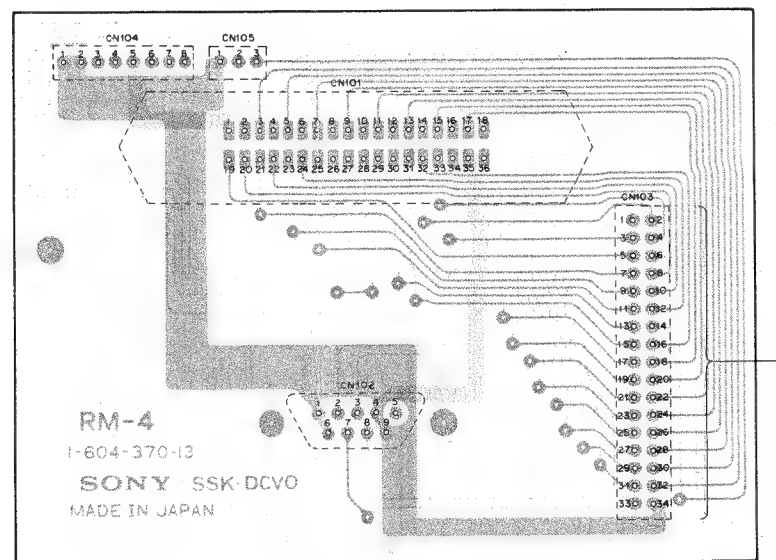
# **MB-36**

BVU-B20 (S/N.10746~(U/C)  
S/N.10201~(J)  
BVU-B20PM(S/N.10006~)

-COMPONENT SIDE-  
1-607-483-12



**MB-9 - SOLDERING SIDE -**  
1-604-374-11

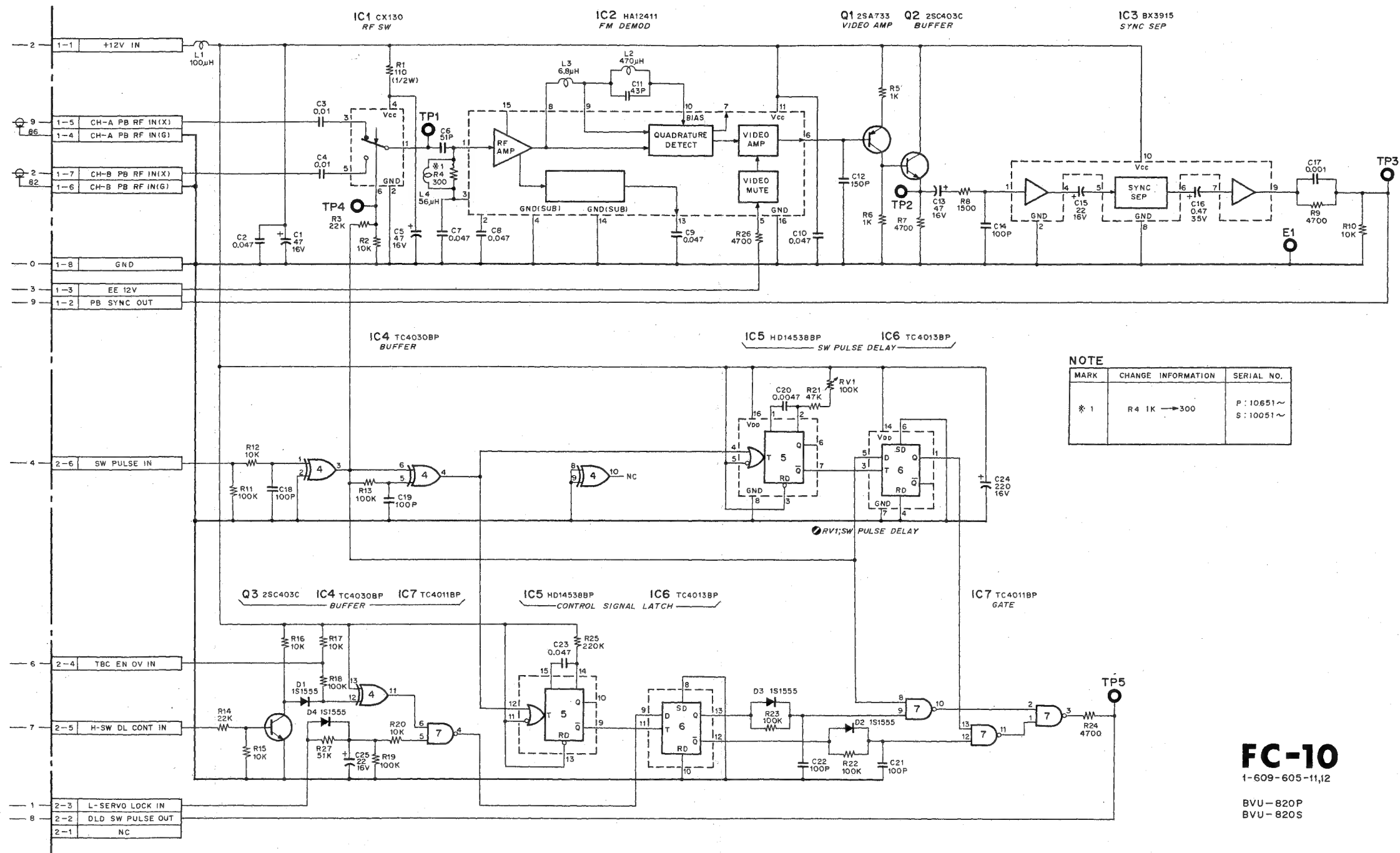








FC-10 (SWITCHING PULSE DELAY IN TBC AND DT)



**FC-10**  
1-609-605-11,12

BUU-820P  
BUU-820S



## SECTION 18

### SPARE PARTS AND FIXTURE

#### 18-1. PARTS INFORMATION

##### 1. Safety Related Component Warning

Components identified by shading marked with **A** on the schematic diagrams, exploded views and electrical spare parts list are critical to safe operation. Replace these components with Sony parts whose parts numbers appear as shown in this manual or in service bulletins and service manual supplements published by Sony.

##### 2. Replacement Parts supplied from Sony Parts Center will sometimes have different shape and outside view from the parts which actually in use. This is due to "accommodating the improved parts and/or engineering changes" or "standardization of genuine parts."

- This manual's exploded views and electrical spare parts lists are indicating the parts numbers of "the standardized genuine parts at present".
- Regarding engineering parts changes in our engineering department, refer Sony service bulletins and service manual supplements.

##### 3. Printed Components in Bold-Face type on the exploded views and electrical spare parts list are normally stocked for replacement purposes. The remaining parts are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.

##### 4. Item with no part number and/or no description are not stocked because they are seldom required for routine service.

##### 5. ( T ) after a spring description is shown on the exploded views in order to indicate the number of a spring turn required for the use.

(Example) Spring, tension (24T); This spring must be cut at its 24th turn for actual use.

#### 18-2. EXPLODED VIEW

- Exploded views are composed of the following blocks.


- (1) Reel Chassis (1)  
S, T reel table  
S, T main brake  
KCA/KCS detector  
6th guide.
- (2) Supply Tension Detector Block  
Supply tension detector  
Supply tension regulator arm  
Tape end detector
- (3) Take-up Tension Detector Block  
Take-up tension detector  
Unthread end detector  
Tape beginning detector

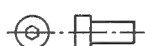

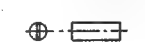
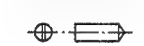
- (4) Threading Block  
Threading ring  
Threading slider  
Thread end 2 detector  
Ring drive gear
- (5) Threading Arm Block  
Threading arm  
Threading motor  
Thread end 1 detector  
V guide
- (6) Pinch Lever Block  
Pinch solenoid  
Pinch lever
- (7) Reel Chassis (bottom view)  
S tension solenoid  
S, T brake solenoid  
Reel motor
- (8) Drum Block  
Head drum  
Slip-ring  
Time code/erase head  
Audio/CTL head  
Capstan motor
- (9) Cassette-up Compartment Block
- (10) Control Panel Block  
Control panel  
Skew corrector
- (11) Function Control Panel Block  
Function control panel  
Key switch  
Search dial  
Hinge (R)  
Hinge (L)
- (12) Power Chassis Block
- (13) Connector Panel Block (1)
- (14) Connector Panel Block (2)  
Remote Connector
- (15) Chassis Block  
Printed circuit board
- (16) Ornamental Panel Block (1)
- (17) Ornamental Panel Block (2)  
Function control panel  
Control panel
- (18) Printed Circuit Board  
Shield case
- (19) Supplied Accessory

- Fixing Screw, Stop Ring and Others

- (1) All the screws used in this machine are the TOTSU type unless otherwise noted. The screws are interchangeable with the Phillips type ( ⊕ ) and slotted type ( ⊖ ) screws.
- (2) Please order as the following parts number when ordering the fixing screws, stop rings, and others.






## SCREW


	PS	PSW	B (BZn N)	B (Cr-N)	PTT	PTTWH
						
2.6 x 4	7-621-972-05	—	7-621-912-10	7-621-912-18	—	—
2.6 x 6	7-621-972-25	7-621-981-15	7-621-912-30	7-621-912-38	—	—
2.6 x 8	7-621-972-35	7-621-981-25	7-621-912-40	7-621-912-48	—	—
3 x 5	7-686-446-01	—	—	—	—	—
3 x 6	7-686-447-01	7-686-527-01	7-686-624-09	7-686-624-04	7-687-411-31	7-687-510-31
3 x 8	7-686-448-01	7-686-528-01	7-686-625-09	7-686-625-04	7-687-412-31	7-687-511-31
3 x 10	7-686-449-01	7-686-529-01	7-686-626-09	7-686-626-04	7-687-413-31	7-687-512-31
3 x 12	7-686-450-01	7-686-530-01	7-686-627-09	7-686-627-04	7-687-414-31	7-687-513-31
3 x 16	7-686-452-01	7-686-532-01	7-686-629-09	7-686-629-04	—	—
3 x 20	7-686-453-01	7-686-533-01	7-686-630-09	7-686-630-04	—	—
3 x 25	7-686-454-01	7-686-534-01	7-686-631-09	7-686-631-04	—	—
4 x 8	7-686-468-01	7-686-548-01	7-686-635-09	7-686-635-04	—	—
4 x 12	7-686-470-01	7-686-550-01	7-686-637-09	7-686-637-04	—	—
4 x 14	7-686-471-01	—	7-686-638-09	7-686-638-04	—	—
4 x 16	7-686-472-01	—	7-686-639-09	7-686-639-04	—	—
4 x 20	7-686-473-01	—	7-686-640-09	7-686-640-04	—	—

	HEXAGON SOCKET SCREW	HEXAGON SET SCREW	(-) SET SCREW FLAT POINT	(-) SET SCREW CONE POINT
				
2.6 x 3	—	7-621-734-09	—	—
2.6 x 4	7-621-996-24	7-621-735-09	—	—
2.6 x 5	—	7-621-736-09	—	—
2.6 x 6	7-683-412-05	—	—	7-621-712-55
2.6 x 8	7-683-413-05	—	—	7-621-712-65
2.6 x 10	—	—	—	7-621-712-75
3 x 5	—	—	7-683-175-01	—
3 x 6	7-683-403-04	—	7-683-176-01	7-683-176-21
3 x 8	7-683-404-04	—	—	7-683-177-21
3 x 10	7-683-405-04	—	—	7-683-178-21



WASHER

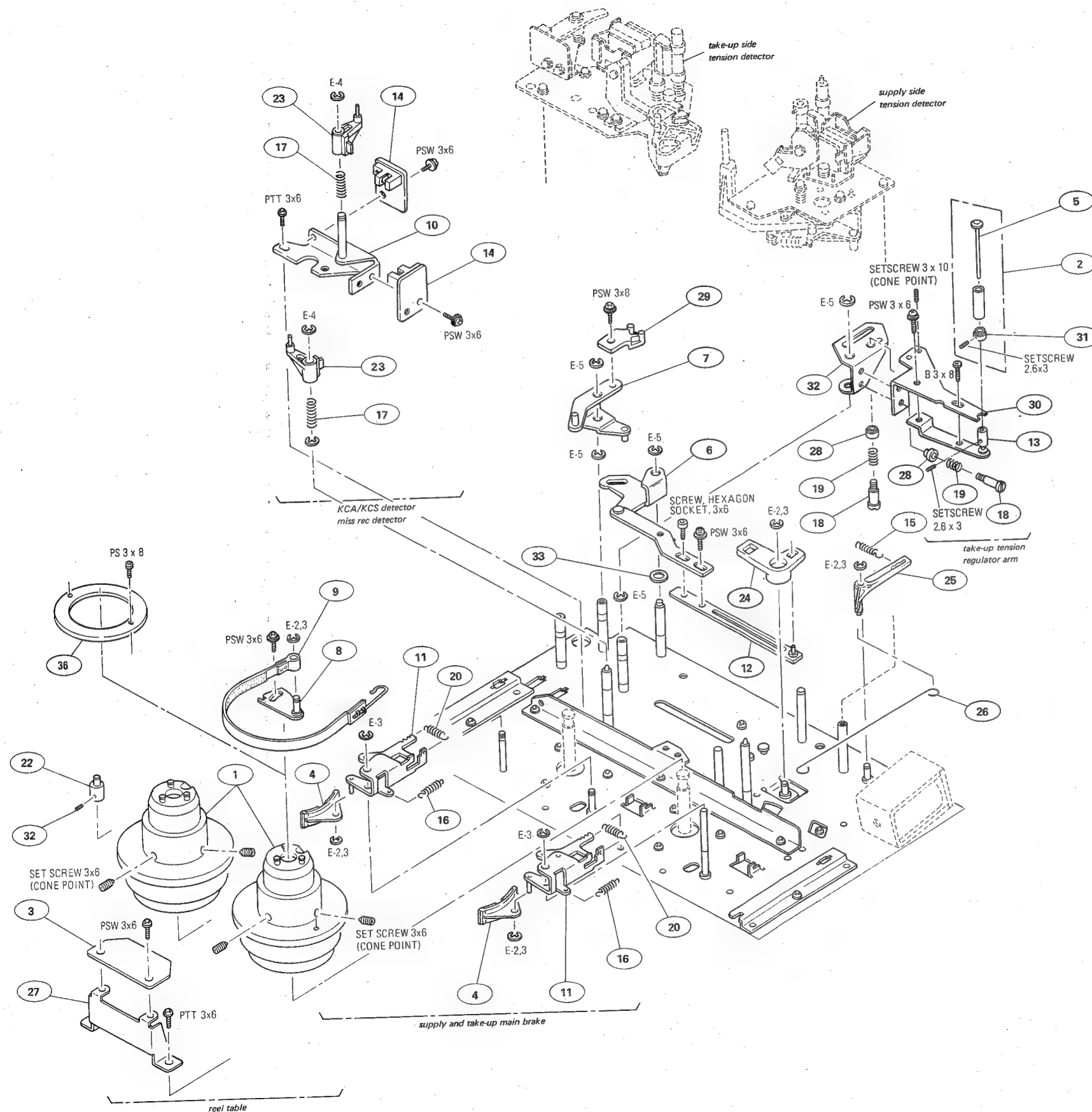
	FLAT WASHER SMALL W. 	FLAT WASHER MIDDLE W. 	SPRING WASHER SW. 	TOOTHED WASHER TYPE B LW. 	HEXAGON NUT N. 
2.6 mm	7-688-002-01	7-688-002-12	7-623-207-22	7-623-421-07	7-622-207-05
3 mm	7-688-003-01	7-688-003-12	7-688-003-11	7-623-422-07	7-684-023-04
4 mm	7-688-004-01	7-688-004-12	7-623-210-22	7-623-423-07	7-684-024-04
5 mm	7-688-005-01	7-688-005-01	7-623-212-22	—	7-684-025-04

	STOP RING E TYPE E. 
2	7-624-104-04
2.3	7-624-105-04
3	7-624-106-04
4	7-624-108-04
5	7-624-109-04
6	7-624-110-04




## REEL CHASSIS (1)

### Reel Chassis (1)



No.	Part No.	Description
1	A-6739-027-A	TABLE ASSY, S REEL
2	A-6746-017-A	ROLLER ASSY, 6G GUIDE
3	A-6748-123-B	DME ASSY, "EM-1"
4	X-3642-166-0	SHOE ASSY
5	X-3668-001-0	GUIDE ASSY, 6G
6	X-3668-021-0	PLATE ASSY, ST
7	X-3668-025-0	ARM ASSY, DRAWER, 6T
8	X-3668-044-0	BRACKET SUB ASSY, TB
9	X-3668-045-0	BAND ASSY, BRAKE
10	X-3668-046-0	BRACKET SUB ASSY, S,D
11	X-3668-047-0	LEVER SUB ASSY, BRAKE
12	X-3668-050-0	PLATE ASSY, DRAWING
13	X-3668-084-0	PLATE ASSY, ADJUSTMENT, 6G
14	1-604-348-00	PRINTED CIRCUIT BOARD, PC-7
15	3-446-195-00	SPRING, TENSION
16	3-535-558-00	SPRING, TENSION
17	3-543-967-00	SPRING, COMPRESSION
18	3-641-621-00	SCREW, HEAD ADJUSTING
19	3-641-622-00	SPRING, COMPRESSION
20	3-642-752-00	SPRING, TENSION
22	3-668-031-00	RETAINER (UPPER), CASSETTE
23	3-668-032-00	ACTUATOR, S,D
24	3-668-033-00	ARM, DRAWER
25	3-668-034-00	LEVER (1), S CHANGE
26	3-668-036-00	ROD, PULL, S
27	3-668-037-02	BRACKET, R-DME
28	3-668-103-00	ROLLER, CAM
29	3-668-215-00	ARM (1), DRAWER, 6G
30	3-668-223-02	BASE, GUIDE, 6G
31	3-668-224-00	GUIDE (3) (LOWER), 6G
32	3-668-229-00	GUIDE (2), No. 6
33	3-701-444-21	WASHER, POLY 6MM DIA. (0.5T)
34	3-701-506-01	SET SCREW, DOUBLE POINT 3x4
36	3-672-979-01	PLATE, REEL TABLE
	(P-----S/N 10601 and higher)	
	(S-----S/N 10051 and higher)	

**NOTE:**

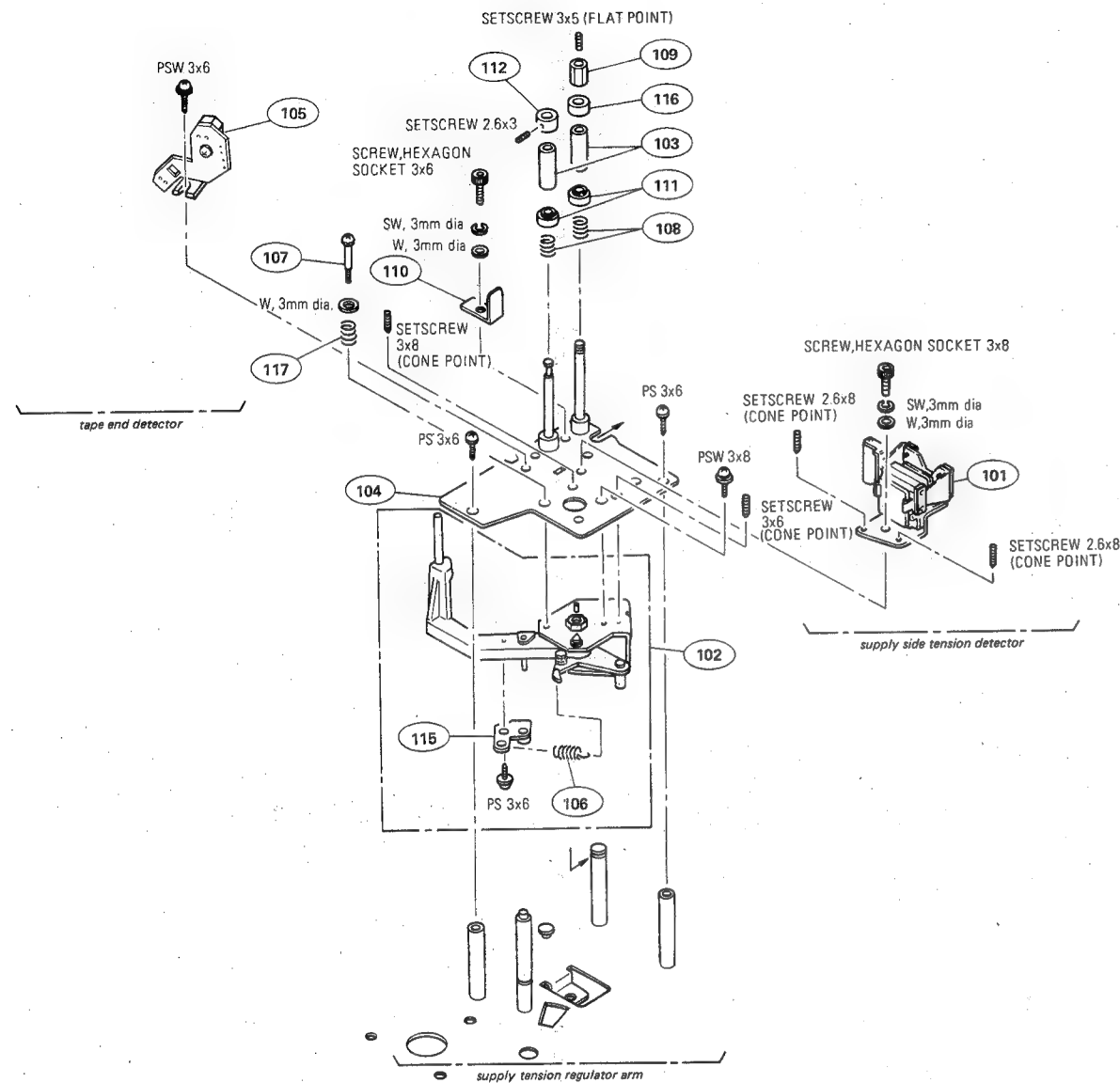
1. The shaded and -marked components are critical to safety.  
Replace only with same components as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.
3. Item with no part number and/or no description are not stocked because they are seldom required for routine service.



# SUPPLY TENSION DETECTOR

# TAKE-UP TENSION DETECTOR

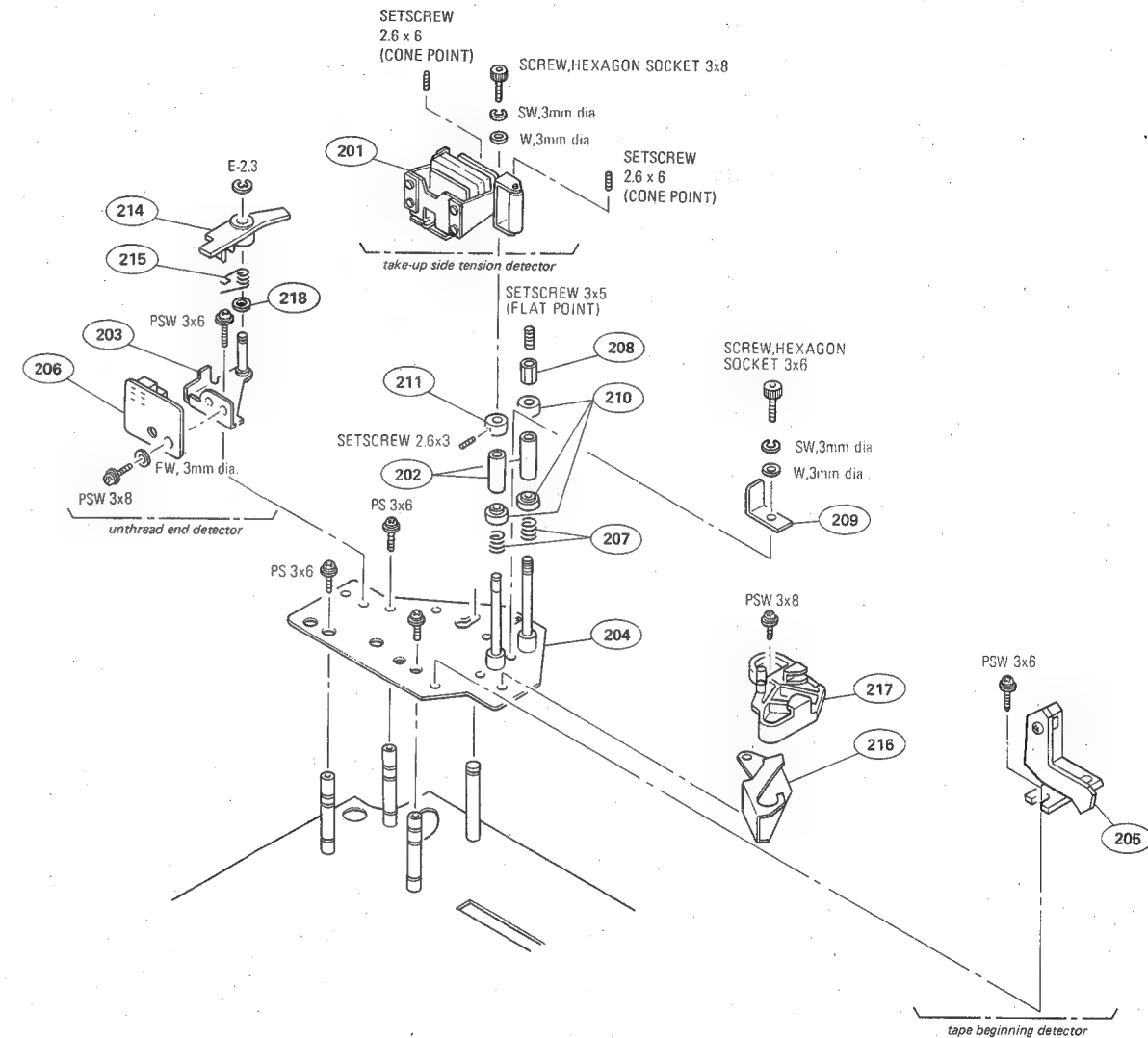
## Supply Tension Detector Block



No.	Part No.	Description
101	A-6742-036-B	DETECTOR (S) ASSY
102	A-6742-038-B	ARM ASSY, TENSION REGULATOR
103	X-3668-005-0	ROLLER ASSY (1), GUIDE
104	X-3668-040-0	BASE SUB ASSY, S-TD
105	A-6742-046-A	PC-8 MOUNT
106	3-140-194-XX	SPRING, TENSION (27T)
107	3-418-191-00	SCREW
108	3-537-213-00	SPRING, COMPRESSION
109	3-641-616-00	NUT, TAPE GUIDE ADJUSTMENT
110	3-668-072-00	STOPPER, T.D


No.	Part No.	Description
111	3-668-073-00	FLANGE (1), G ROLLER
112	3-668-074-00	FLANGE (2), G ROLLER
115	3-668-094-00	BRACKET, T.S
116	3-668-471-00	FLANGE (3), G ROLLER
117	3-428-132-00	SPRING COMPRESSION

## Take-up Tension Detector Block



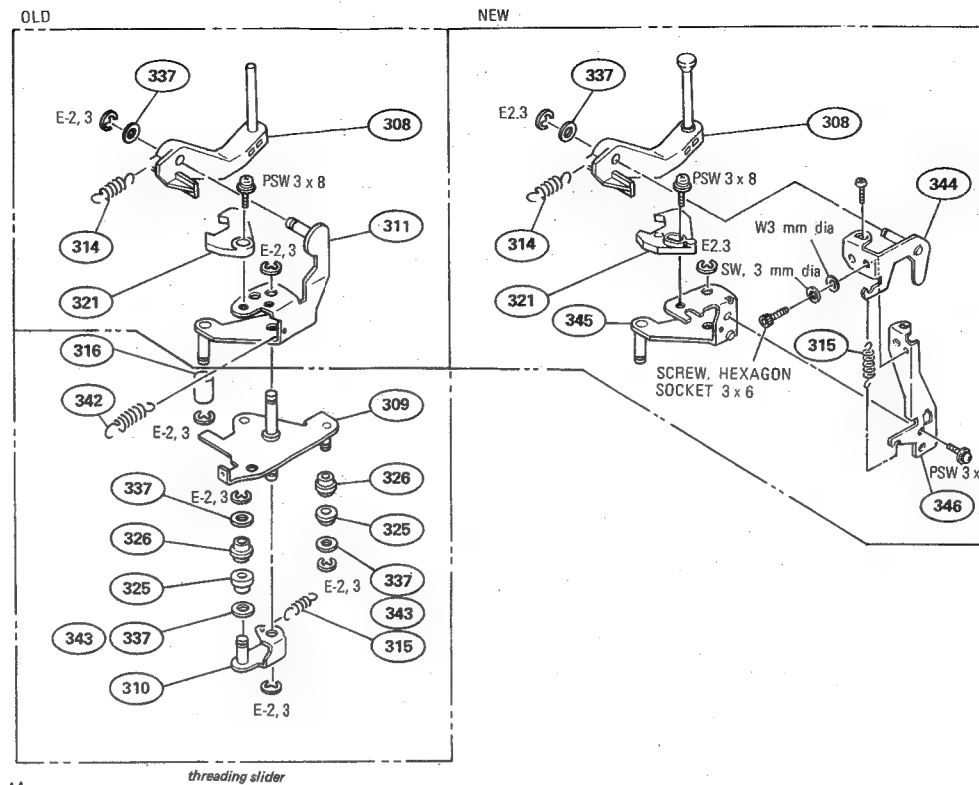
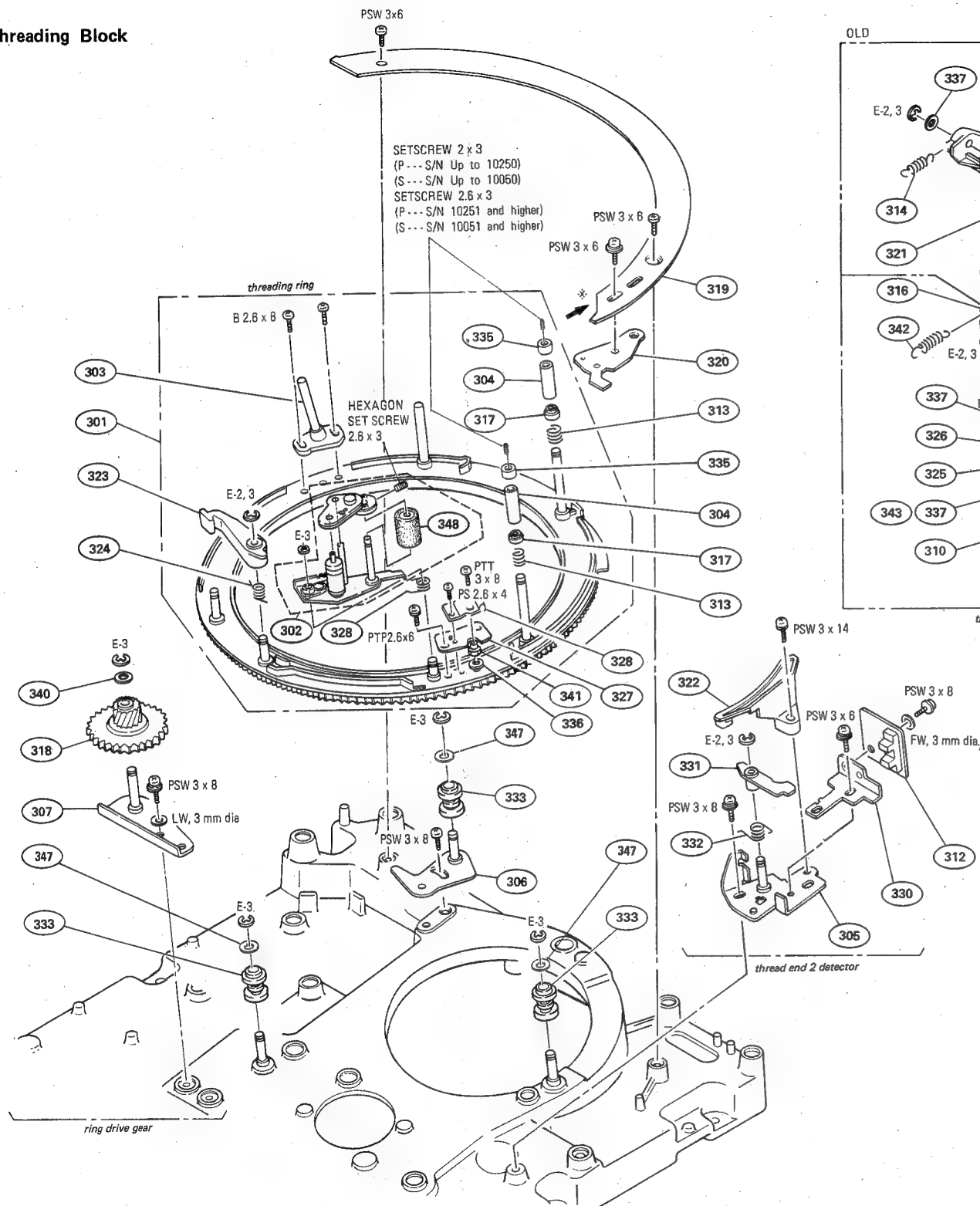
No.	Part No.	Description
201	A-6742-034-A	DETECTOR (T) ASSY
202	X-3668-005-0	ROLLER ASSY (1), GUIDE
203	X-3668-022-0	BASE ASSY, END, UT
204	X-3668-032-0	BASE SUB ASSY, T-TD
205	A-6742-047-A	PC-12 MOUNT
206	1-604-354-00	PRINTED CIRCUIT BOARD, EK-2
207	3-537-213-00	SPRING, COMPRESSION
208	3-641-616-00	NUT, TAPE GUIDE ADJUSTMENT
209	3-668-072-00	STOPPER, T.D
210	3-668-073-00	FLANGE (1), G ROLLER
211	3-668-074-00	FLANGE (2), G ROLLER
214	3-668-219-00	SENSOR, END, UT
215	3-668-220-00	SPRING
216	3-668-252-00	HOLDER, 5G
217	3-668-442-00	HOLDER (2), 5G
218	3-701-439-11	WASHER, POLY, 3MM DIA. (0.25T)

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## Threading Block




No.	Part No.	Description	No.	Part No.	Description
342	4-858-754-00	<b>SPRING, TENSION</b> (P --- S/N Up to 10040) 3-480-157-00 <b>SPRING, TENSION</b> (P --- S/N 10041 and higher)	321	3-668-245-00	<b>PLATE (2), M-T.H.</b> (P --- S/N Up to 10040) 3-668-245-03 <b>PLATE (2), M-T.H.</b> (P --- S/N 10041 and higher)
343	3-701-439-11	<b>WASHER, POLY 3MM DIA. (0.25T)</b> (P --- S/N 10041 and higher)	322	3-668-246-00	<b>CAM, M RELEASE</b>
344	X-3668-104-0	<b>SUPPORT ASSY, ARM</b> (P --- S/N 10041 and higher)	323	3-668-247-00	<b>LEVER (3), RWD</b>
345	X-3668-105-0	<b>HOLDER (LOWER) ASSY, M</b> (P --- S/N 10041 and higher)	324	3-668-248-02	<b>SPRING, TORSION</b>
346	3-672-963-00	<b>HOLDER (UPPER), M</b> (P --- S/N 10041 and higher)	325	3-668-250-00	<b>ROLLER (1), M</b>
347	3-701-441-01	<b>WASHER, POLY 4MM DIA. (0.13T)</b> (P --- S/N 10691 and higher) (S --- S/N 10051 and higher)	326	3-668-251-00	<b>ROLLER (2), M</b>
348	X-3668-758-3	<b>PINCH ROLLER ASSY</b>	327	3-668-256-03	<b>PLATE, BASE</b>
			328	3-668-257-03	<b>SPRING, LEAF</b>
			329	3-668-261-00	<b>SPRING, TORSION</b>
			330	3-668-282-00	<b>BRACKET, PC</b>
			331	3-668-283-00	<b>SENSOR, END</b>
			332	3-668-284-00	<b>SPRING</b>
			333	3-672-977-00	<b>ROLLER, RING</b>
			335	3-668-437-02	<b>FLANGE (UPPER), ROLLER</b> (P --- S/N Up to 10250) (S --- S/N Up to 10050)
				3-668-437-03	<b>FLANGE (UPPER), ROLLER</b> (P --- S/N 10251 and higher) (S --- S/N 10051 and higher)
			336	3-672-910-00	<b>WASHER, RUBBER</b>
			337	3-701-439-21	<b>WASHER, POLY 3MM DIA. (0.5T)</b>
			340	3-701-441-21	<b>WASHER, POLY 4MM DIA. (0.5T)</b>

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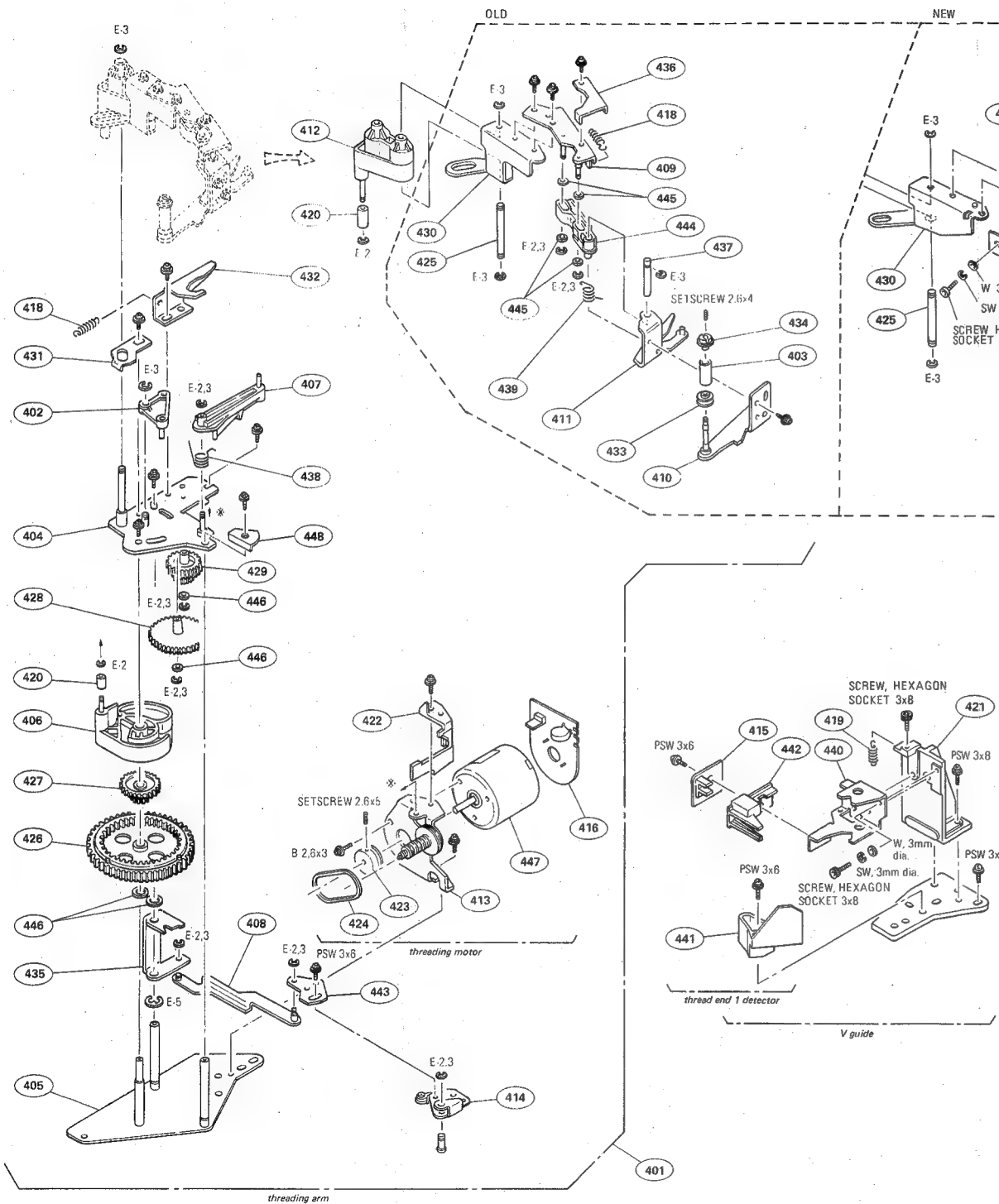
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Threading Arm Block


THREADING ARM

THREADING ARM



No.	Part No.	Description
401	A-6750-119-A	THREADING ASSY, T
402	X-3668-002-0	LEVER ASSY, R.C.
403	<b>X-3668-006-0</b>	<b>ROLLER ASSY (2), GUIDE</b>
404	X-3668-011-0	BASE (UPPER) ASSY, BLOCK, GEAR
405	X-3668-012-0	BASE (LOWER) ASSY, BLOCK, GEAR
406	<b>X-3668-013-0</b>	<b>CAM ASSY, M</b>
407	<b>X-3668-014-0</b>	<b>ARM ASSY, ROTARY</b>
408	X-3668-015-0	LEVER ASSY, RG
409	X-3668-016-0	ARM ASSY, THREADING (S/N Up to 10040)
	X-3668-016-3	ARM ASSY, THREADING (S/N 10041 and higher)
410	X-3668-017-0	ARM (1) ASSY, T. (S/N Up to 10040)
	X-3668-017-3	ARM (1) ASSY, T. (S/N 10041 and higher)
411	X-3668-018-0	ARM (2) ASSY, T. (S/N Up to 10040)
412	X-3668-019-0	HOLDER ASSY, T.H.
413	<b>X-3668-020-0</b>	<b>BRACKET ASSY, MOTOR</b>
414	<b>X-3668-099-0</b>	<b>SENSOR ASSY, RING</b>
415	1-604-355-00	PRINTED CIRCUIT BOARD, EK-3
416	1-604-364-00	PRINTED CIRCUIT BOARD, TM-8
417	<b>3-486-135-XX</b>	<b>SPRING, TENSION (13T)</b>
418	3-540-226-00	SPRING, TENSION
419	<b>3-630-419-XX</b>	<b>SPRING, TENSION (16T)</b>
420	3-642-410-00	ROLLER
421	<b>3-642-474-00</b>	<b>BRACKET, ARM</b>
422	3-668-171-02	COVER, WORM
423	<b>3-668-172-00</b>	<b>PULLEY (3), LM</b>
424	<b>3-668-173-00</b>	<b>BELT (3), LM</b>
425	3-668-184-00	SHAFT, ARM, S
426	3-668-185-00	GEAR, RING
427	3-668-186-00	GEAR
428	3-668-187-00	GEAR, MIDWAY
429	3-668-188-00	WHEEL
430	3-668-190-03	ARM (1), THREADING
431	3-668-191-00	STOPPER, END, T.
432	3-668-192-04	CAM, UNTHREAD
433	<b>3-668-193-03</b>	<b>FLANGE (LOWER), GUIDE</b>
434	<b>3-668-194-02</b>	<b>FLANGE (UPPER), GUIDE</b>
435	3-668-195-00	STOPPER, U.T
436	3-668-196-00	STOPPER, ARM, T. (S/N Up to 10040)
437	3-668-197-00	PIN, CENTER (S/N Up to 10040)
	3-668-197-02	PIN, CENTER (S/N 10041 and higher)
438	3-668-198-00	SPRING
439	3-668-199-03	SPRING
440	3-668-212-00	GUIDE, V
441	3-668-213-03	CAM, T.H.D.
442	3-668-214-03	COVER, P.H.C.
443	3-668-222-00	SENSOR (2), RING
444	3-668-329-03	ARM, LIMITER
445	<b>3-701-439-21</b>	<b>WASHER, POLY 3MM DIA. (0.5T)</b>

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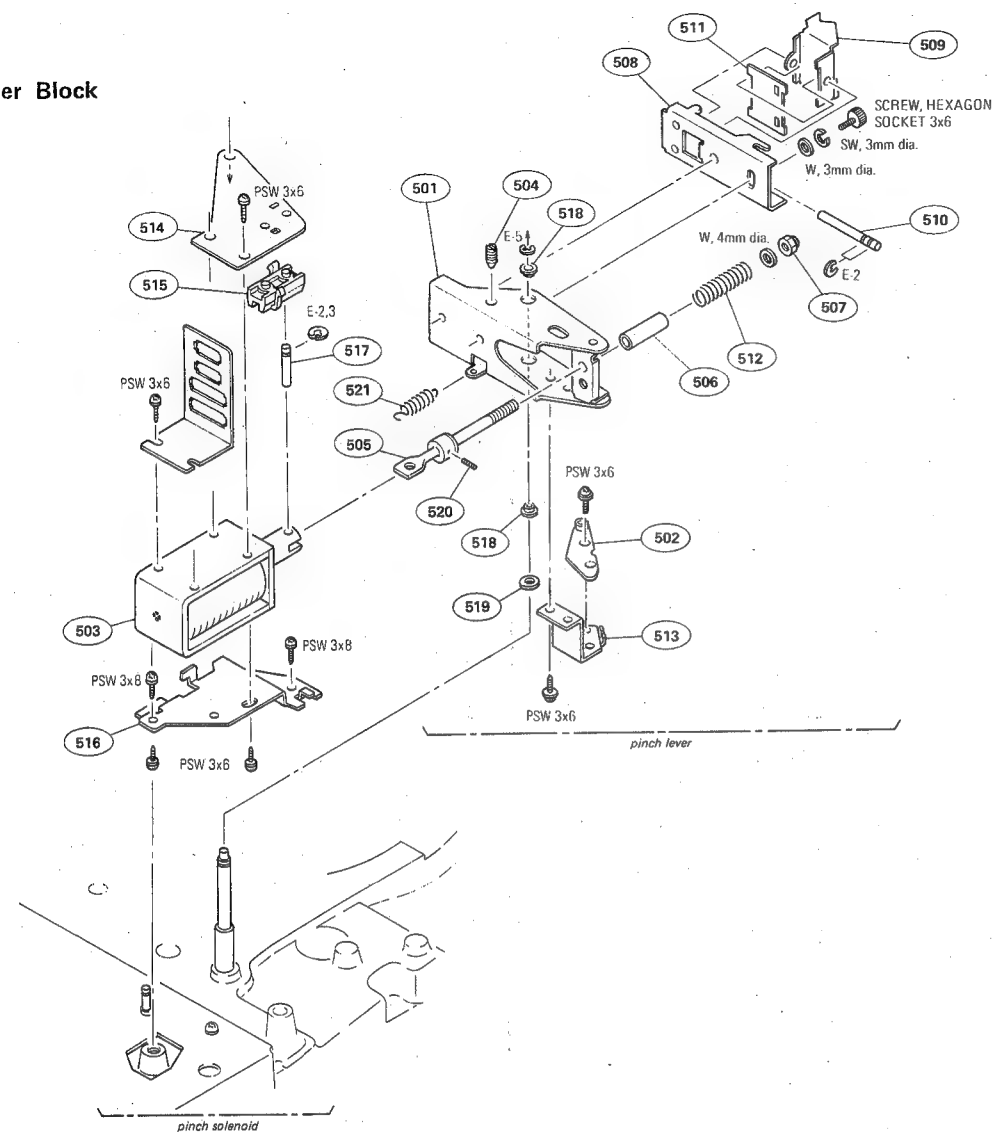
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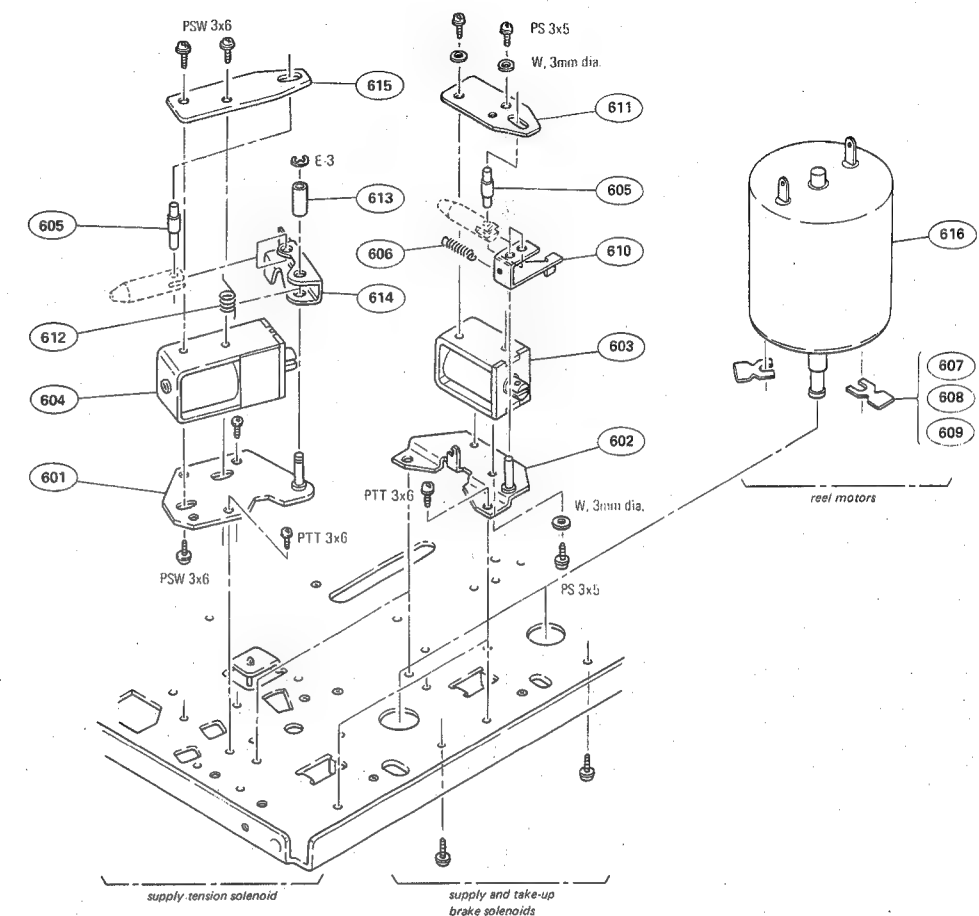
# PINCH LEVER REEL CHASSIS (BOTTOM VIEW)

Pinch Lever Block




No.	Part No.	Description	No.	Part No.	Description
501	X-3668-007-0	PINCH LEVER SUB ASSY	511	3-668-277-00	SPRING
502	X-3668-008-0	PLATE ASSY, ROLLER, CAM	512	3-668-278-00	SPRING, COMPRESSION
<b>503</b>	<b>1-454-276-00</b>	<b>SOLENOID (PINCH, PM205)</b>	513	3-668-279-00	BASE, CAM ROLLER
504	3-642-805-00	SCREW, ADJUSTING	514	3-668-289-00	REINFORCEMENT
505	3-648-054-00	ROD, PLUNGER JOINT	515	3-668-290-00	GUIDE, SHAFT
506	3-648-056-00	SPACER, 4x18	516	3-668-291-00	BRACKET, SOLENOID
507	3-648-057-00	NUT (ISO-4), U	517	3-668-292-00	SHAFT, SOLENOID
508	3-668-273-00	PINCH LEVER (B)	518	3-668-294-00	SPACER, PINCH
509	3-668-274-00	PINCH LEVER (C)	<b>519</b>	<b>3-701-444-11</b>	<b>WASHER, POLY 6MM DIA. (0.25T)</b>
510	3-668-276-00	SHAFT	520	3-701-508-00	SET SCREW, DOUBLE POINT 3x6
			<b>521</b>	<b>3-701-788-XX</b>	<b>SPRING, TENSION (48T)</b>

Reel Chassis (bottom view)



No.	Part No.	Description	No.	Part No.	Description
601	X-3668-048-0	BRACKET SUB ASSY, KS	611	3-668-044-00	GUIDE, BP
602	X-3668-049-0	BRACKET SUB ASSY, BP	612	3-668-047-00	SPRING
<b>603</b>	<b>1-454-278-00</b>	<b>SOLENOID (BRAKE, PM203, 204)</b>	613	3-668-048-01	SPACER (DIA. 4x12)
<b>604</b>	<b>1-454-279-00</b>	<b>SOLENOID (S.TENSION, PM201)</b>	614	3-668-049-00	LEVER, KS
605	3-645-051-03	PIN, D-PINCH PLUNGER	615	3-668-050-00	PLATE, GUIDE, KS
606	3-645-392-00	SPRING, TENSION	<b>616</b>	<b>8-835-050-01</b>	<b>MOTOR, DC (MNR-4400A)</b>
<b>607</b>	<b>3-651-334-01</b>	<b>SPACER, REEL MOTOR (0.02T)</b>			<b>(REEL, M206, 207)</b>
<b>608</b>	<b>3-651-334-11</b>	<b>SPACER, REEL MOTOR (0.05T)</b>			
<b>609</b>	<b>3-651-334-21</b>	<b>SPACER, REEL MOTOR (0.1T)</b>			
610	3-668-043-00	ARM, BP			

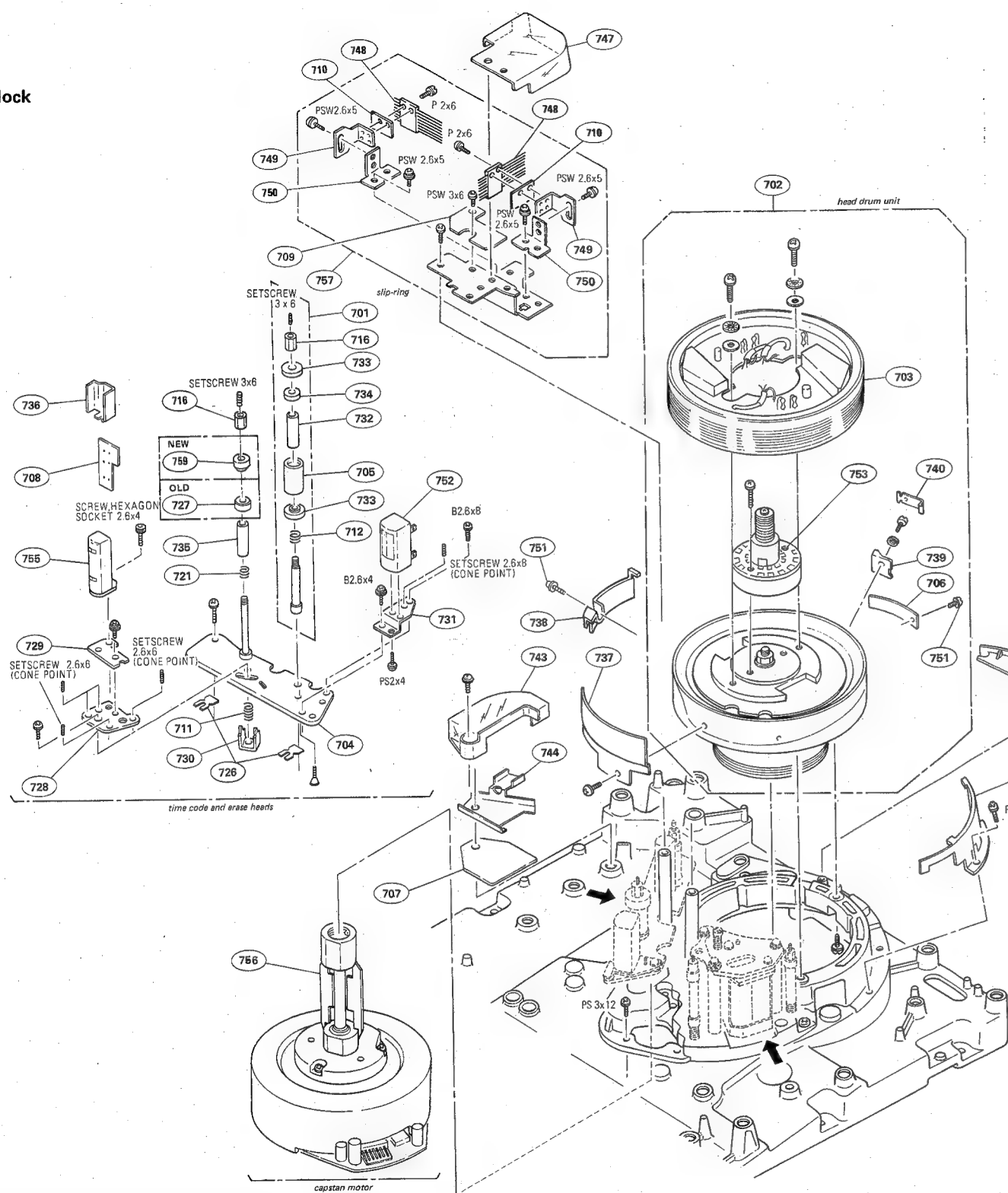
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# DRUM DRUM

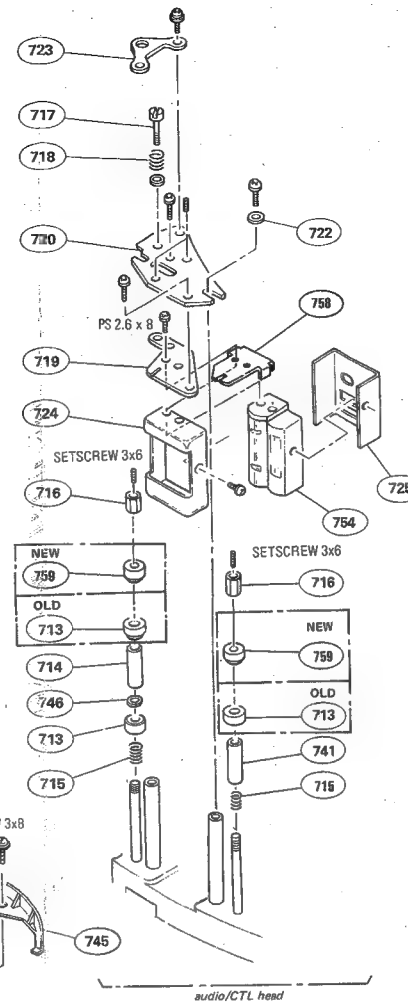
## Drum Block



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- P ..... # 11280  
S ..... # 10060
- P ..... # 11281  
S ..... # 10061

No.	Part No.	Description
756	8-838-019-01	MOTOR, DC (BHF-1600A)
757	A-6709-390-A	BRUSH (8) ASS'Y
758	3-669-985-00	PLATE, ADJUSTMENT
	(P ..... S/N 10401 and higher)	
	(S ..... S/N 10051 and higher)	
759	3-688-807-01	FLANG, TAPE GUIDE
	(SERIAL No. <b>NOTE 5</b> and higher)	



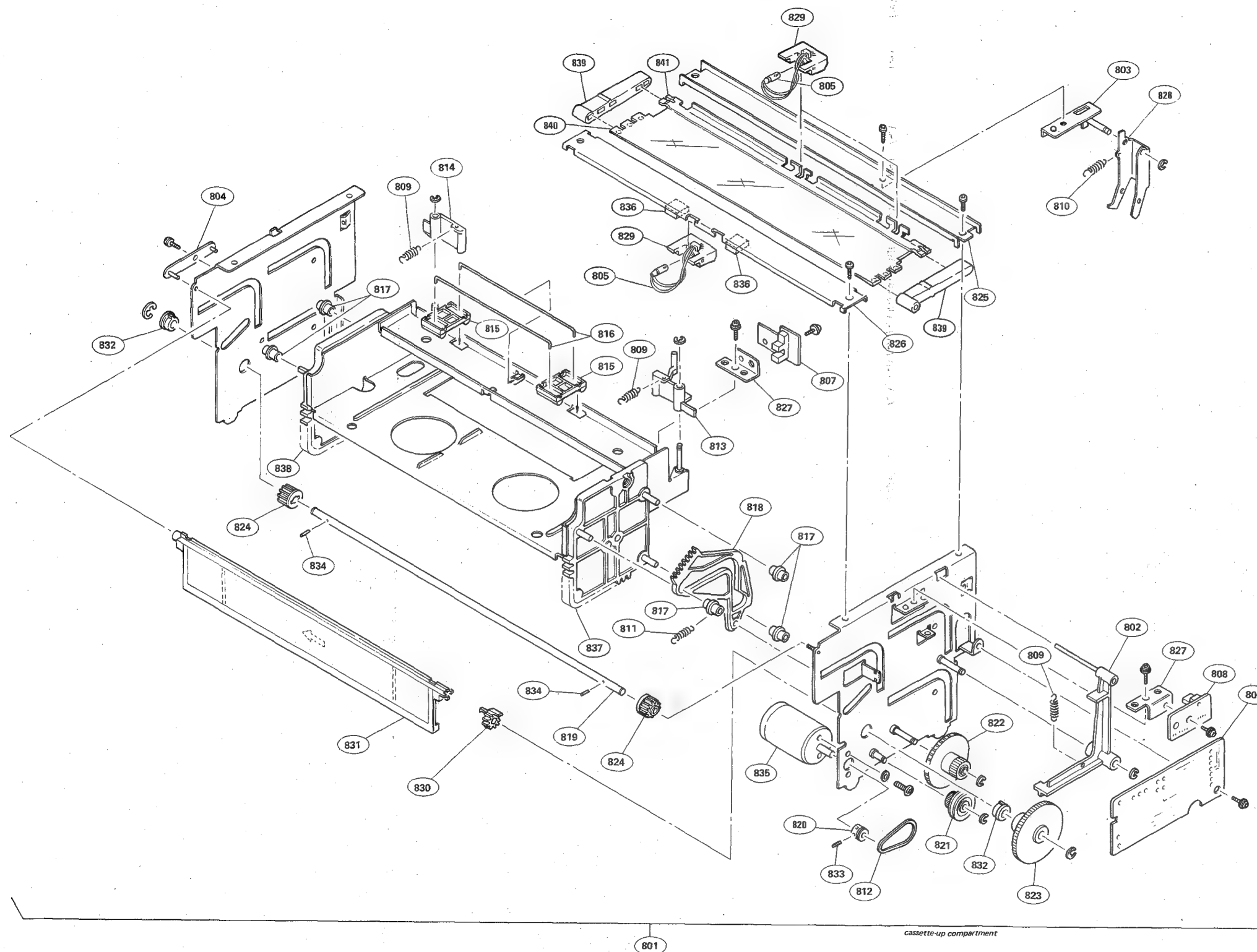
No.	Part No.	Description
741	3-660-102-00	GUIDE, TAPE
	(P ..... S/N Up to 10500)	
	(S ..... S/N Up to 10050)	
	3-672-978-00	GUID TAPER
	(P ..... S/N 10501 and higher)	
	(S ..... S/N 10051 and higher)	
742	3-668-293-00	GUARD, HEAD
743	3-668-441-00	COVER, HARNESS
744	3-668-462-00	HOLDER, TM-4
745	3-668-472-02	PROTECTOR (R)
746	3-669-952-00	WASHER, TAPE GUIDE
747	3-671-307-00	PROTECTOR, BRUSH
748	3-671-309-00	BRUSH (M)
749	3-671-323-00	BRACKET (A), BRUSH
750	3-671-324-00	BRACKET (B), BRUSH
751	3-703-567-00	SCREW, SMALL
752	8-825-544-10	HEAD, ERASE (EF232-58)
	(FULL ERASE, H203)	
	(P ..... S/N Up to 10500)	
	(S ..... S/N Up to 10050)	
	8-825-544-20	HEAD, ERASE (EF248-58)
	(FULL ERASE, H203)	
	(P ..... S/N 10501 and higher)	
	(S ..... S/N 10051 and higher)	
753	8-825-680-30	RING (8) ASSY, SLIP
754	8-829-358-35	HEAD AUDIO/CTL (EPP150-5803B)
755	8-829-371-11	HEAD, T/C (PP171-5802D)

No.	Part No.	Description
701	A-6709-349-A	ROLLER GUIDE ASSY, D
702	A-6709-433-A	HEAD DRUM ASSY, DUH-26A-R
703	A-6709-435-A	UPPER DRUM ASSY, DUR-26-R
704	X-3655-606-0	BASE ASSY, GH
	(SERIAL No. Up to <b>NOTE 4</b> )	
	X-3655-666-3	BASE ASS'Y, GH
	(SERIAL No. <b>NOTE 5</b> and higher)	
705	X-3655-607-0	ROLLER ASSY, GUIDE
706	1-586-633-00	CONDENSATION, SENSOR
707	1-604-367-00	PRINTED CIRCUIT BOARD, TM-4
708	1-604-760-00	PRINTED CIRCUIT BOARD, TC-12
709	1-605-755-00	PRINTED CIRCUIT BOARD, SR-17
710	1-605-756-00	PRINTED CIRCUIT BOARD, DV-3
711	3-434-141-00	SPRING, COMPRESSION
712	3-537-214-00	SPRING (LOWER), COMPRESSION
713	3-641-612-00	GUIDE, TAPE
714	3-641-613-00	GUIDE, TAPE
715	3-641-615-00	SPRING, COMPRESSION
716	3-641-616-00	NUT, TAPE GUIDE ADJUSTMENT
717	3-641-621-00	SCREW, HEAD ADJUSTING
718	3-641-622-00	SPRING, COMPRESSION
719	3-641-640-00	BRACKET, (1) C.T.L. HEAD
720	3-641-641-02	BRACKET, (2) C.T.L. HEAD
721	3-644-718-00	SPRING, COMPRESSION
	(SERIAL No. Up to <b>NOTE 4</b> )	
	3-641-615-00	SPRING, COMPRESSION
	(SERIAL No. <b>NOTE 5</b> and higher)	
722	3-645-076-00	WASHER, M-REEL S
723	3-647-815-00	PLATE, ADJUSTING, CTL HEAD
724	3-650-301-02	COVER, HEAD, D-CTL
725	3-650-302-00	COVER, HEAD, (REAR)
726	3-651-334-11	SPACER, REEL MOTOR (0.05T)
727	3-655-616-00	FLANGE (E.F), GUIDE
	(SERIAL No. Up to <b>NOTE 4</b> )	
728	3-655-618-00	BASE, TC
729	3-655-619-00	BRACKET, TC
730	3-655-620-00	SUPPORT, GUIDE
731	3-655-621-00	BRACKET, HEAD, E
	(P ..... S/N Up to 10500)	
	(S ..... S/N Up to 10050)	
	3-655-652-00	BRACKET (2), E HEAD
	(P ..... S/N 10501 and higher)	
	(S ..... S/N 10051 and higher)	
732	3-655-625-00	SLEEVE, INNER
733	3-655-626-00	FLANGE
734	3-655-628-00	BEARING, BALL
735	3-655-630-00	GUIDE (E), TAPE
	(SERIAL No. Up to <b>NOTE 4</b> )	
	3-655-630-02	GUIDE (E), TAPE
	(SERIAL No. <b>NOTE 5</b> and higher)	
736	3-655-638-00	SHIELD, TC HEAD
737	3-655-639-00	PLATE, SHIELD, TC
738	3-655-640-00	STOPPER, TAPE
739	3-656-501-00	HOLDER, TERMINAL
740	3-656-502-00	PLATE, TERMINAL




# CASSETTE-UP COMPARTMENT CASSETTE-UP COMPARTMENT

Cassette-up Compartment Block



No.	Part No.	Description
801	A-6751-104-C	CASSETTE COMPARTMENT ASSY
802	X-3668-059-0	ARM ASSY, SWITCH, DOWN
803	X-3668-060-3	HOLDER ASSY, ARM
804	X-3668-061-0	SUPPORT ASSY, LID
805	1-518-508-00	LAMP, PILOT (PL207, 208, 209)
806	1-604-429-00	PRINTED CIRCUIT BOARD, CC-9
807	1-604-430-00	PRINTED CIRCUIT BOARD, CC-10
808	1-604-431-00	PRINTED CIRCUIT BOARD, CC-11
809	3-507-051-00	SPRING, TENSION
810	3-534-217-00	SPRING, TENSION
811	3-536-780-00	SPRING, TENSION
812	3-653-387-00	BELT, LM
813	3-668-295-00	LEVER (RIGHT), CASSETTE PUSH-OUT
814	3-668-296-00	LEVER (LEFT), CASSETTE PUSH-OUT
815	3-668-297-00	RETAINER, CASSETTE
816	3-668-298-00	SPRING
817	3-668-299-00	ROLLER, GUIDE
818	3-668-300-00	CAM, LID OPEN
819	3-668-301-00	SHAFT, DRIVING
820	3-668-302-00	PULLEY, MOTOR
821	3-668-303-00	GEAR (A)
822	3-668-304-00	GEAR (B)
823	3-668-305-00	GEAR (C)
824	3-668-306-00	GEAR (D)
825	3-668-307-02	JOINT (R)
826	3-668-308-03	JOINT (F)
827	3-668-309-00	BRACKET, SWITCH
828	3-668-310-02	ARM, LID OPEN
829	3-668-314-02	HOLDER, LAMP
830	3-668-315-02	GEAR, LID
831	3-668-371-00	LID, CASSETTE
832	3-668-474-00	BEARING
833	3-701-506-01	SET SCREW, DOUBLE POINT 3x4
834	3-703-358-00	PIN, PARALLEL (DIA. 2x8)
835	8-835-055-01	MOTOR, DC (DNR-4700A) (CASSETTE, M207)
836	3-672-926-00	CUSHION, LID
837	X-3668-057-0	CASECON ASS'Y, RACK (RIGHT)
838	X-3668-058-0	CASECON ASS'Y, RACK (LEFT)
839	3-668-313-02	FRAME, SUPPORT, REFLECTOR
840	3-672-604-11	REFLECTOR
841	3-672-639-03	BRACKET, LAMP

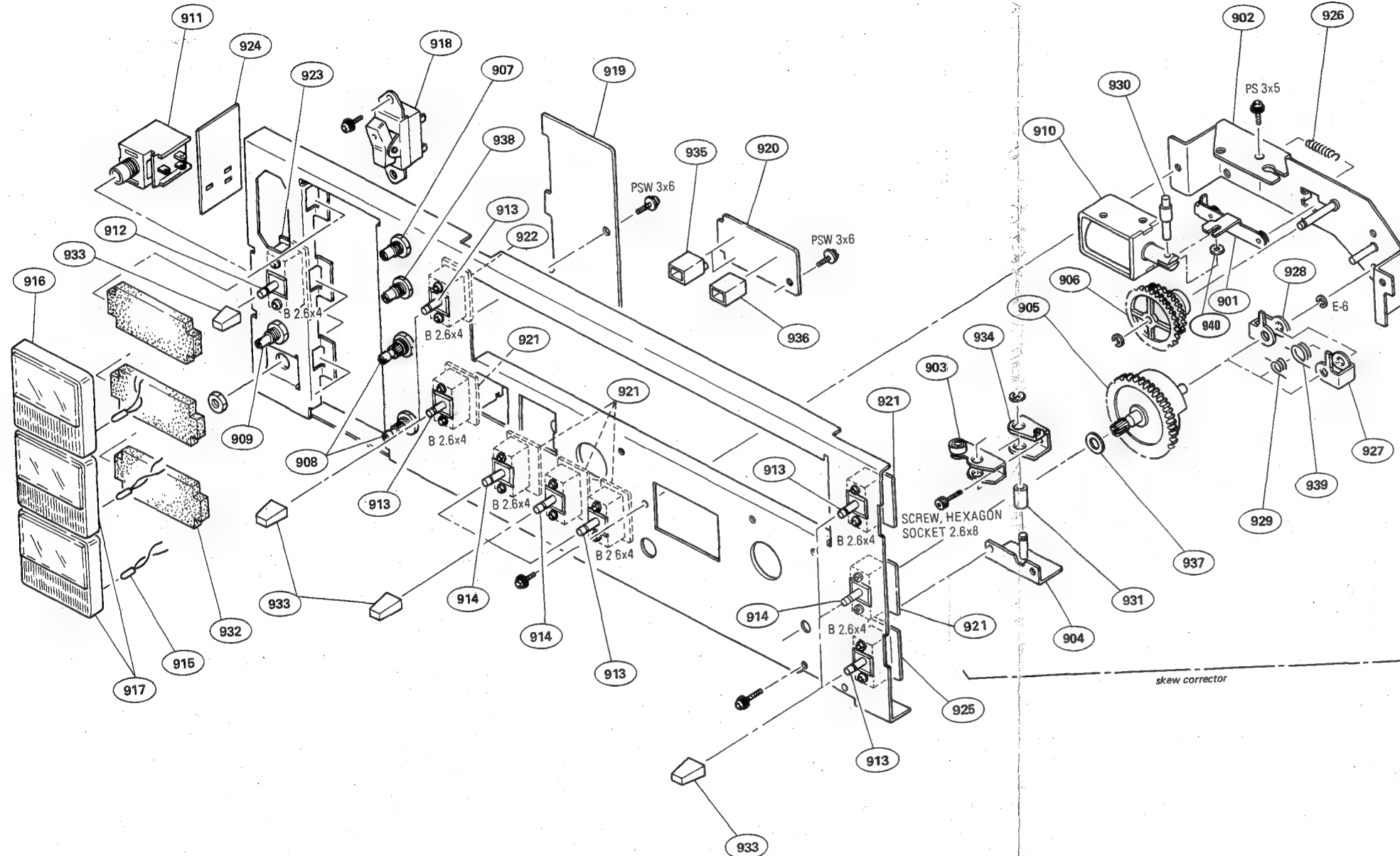
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# CONTROL PANEL CONTROL PANEL

Control Panel Block



No.	Part No.	Description
901	X-3668-030-0	PLATE ASSY, LOCK, SK
902	X-3668-031-0	SUPPORT ASSY, SK
903	X-3668-033-0	LEVER (2) ASSY, S
904	X-3668-034-0	BRACKET ASSY, LEVER, S
905	X-3668-035-0	GEAR (3) ASSY, CLUTCH
906	X-3668-036-0	CLUTCH ASSY, SK
907	1-226-616-00	R, VAR, CARBON 100K
908	1-228-140-00	R, VAR, CARBON 20K/20K
909	1-228-218-00	R, VAR, CARBON 500/500 (RV1)
910	1-454-278-00	SOLENOID (SKEW, PM202)
911	1-507-553-00	JACK, JM-60 M-13S
912	1-516-963-00	SWITCH, LEVER SLIDE
913	1-516-994-00	SWITCH, LEVER SLIDE
914	1-516-995-00	SWITCH, LEVER SLIDE
915	1-518-461-00	LAMP, PILOT
916	1-520-438-00	METER, VIDEO (VIDEO/RF, ME201)
917	1-520-439-00	METER, VU (AUDIO CH-1: ME-202, AUDIO CH-2: ME203)
918	1-553-159-00	SWITCH, ROCKER (POWER, S201)
919	1-604-365-00	PRINTED CIRCUIT BOARD, MF-1
920	1-604-366-00	PRINTED CIRCUIT BOARD, WL-1
921	1-604-368-00	PRINTED CIRCUIT BOARD, MS-5
922	1-604-371-00	PRINTED CIRCUIT BOARD, LV-1
923	1-604-375-00	PRINTED CIRCUIT BOARD, AO-2
924	1-604-378-00	PRINTED CIRCUIT BOARD, HP-5
925	1-604-511-00	PRINTED CIRCUIT BOARD, PR-33
926	3-537-219-00	SPRING, TENSION
927	3-642-403-00	LEVER
928	3-642-404-00	LEVER
929	3-642-405-00	SPRING
930	3-645-051-03	PIN, D-PINCH PLUNGER
931	3-654-603-11	SPACER, 3x11
932	3-668-022-00	CUSHION, METER
933	3-668-028-00	KNOB (SMALL), LEVER SWITCH
934	3-668-111-00	LEVER (1), S
935	3-668-123-00	HOLDER, LAMP
936	3-668-124-00	HOLDER, LED
937	3-701-444-21	WASHER, POLY 6MM DIA. (0.5T)
938	1-224-691-XX	R, VAR, CARBON 10K
939	3-642-679-00	SPRING

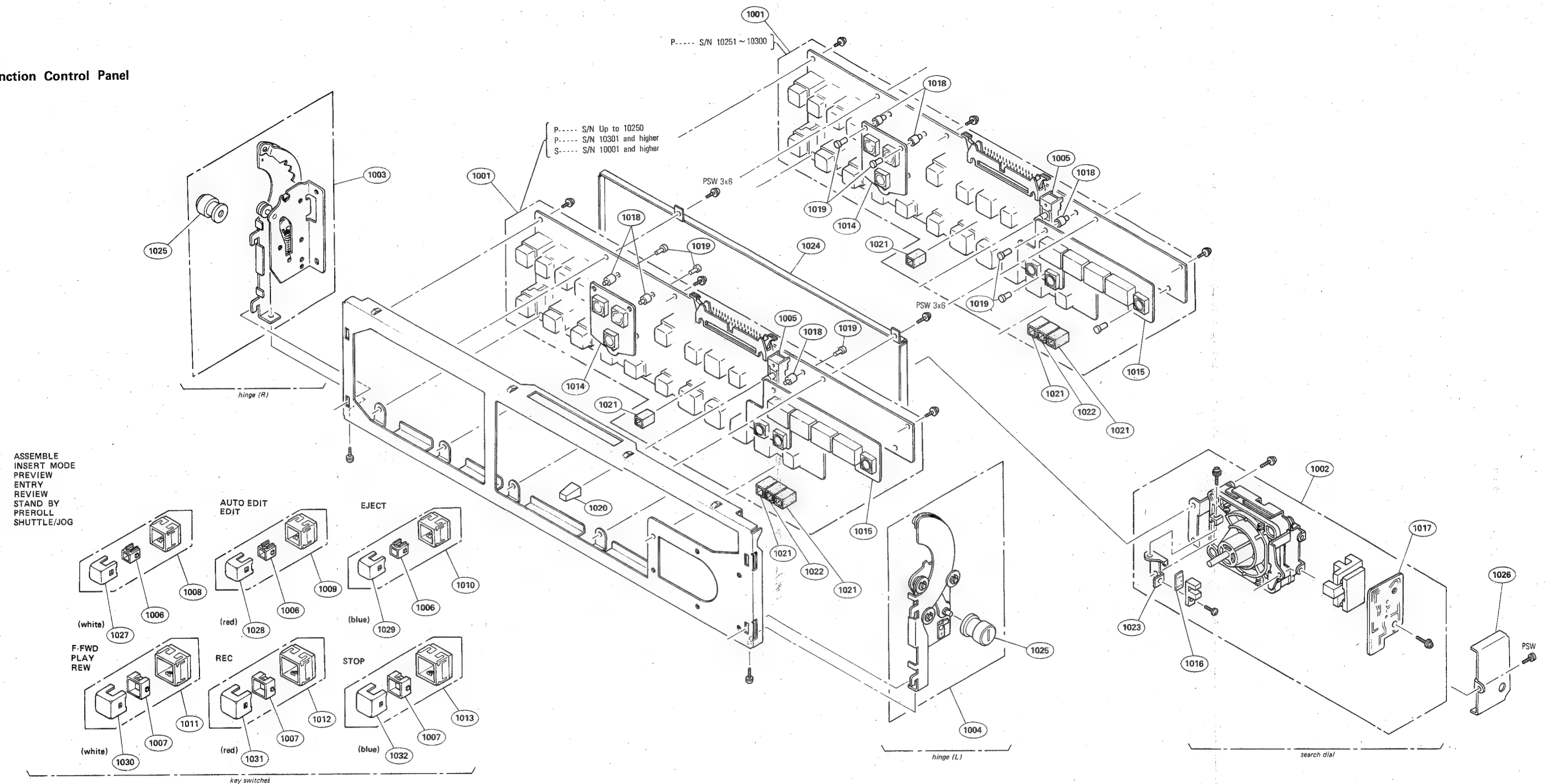
## NOTE:

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- Item with no part number and/or no description are not stocked because they are seldom required for routine service.



# FUNCTION CONTROL      FUNCTION CONTROL

## Function Control Panel



No.	Part No.	Description
1001	A-6717-205-A	MOUNTED CIRCUIT BOARD, KY-9
1002	A-6734-106-A	DIAL ASSY, SEARCH
1003	A-6736-030-A	HINGE (L) ASSY
1004	A-6736-031-A	HINGE (R) ASSY
1005	1-516-994-00	SWITCH, LEVER SLIDE
1006	1-518-450-31	LAMP, PILOT
1007	1-518-450-21	LAMP, PILOT
1008	1-554-318-11	SWITCH, KEY
1009	1-554-318-21	SWITCH, KEY
1010	1-554-318-31	SWITCH, KEY

No.	Part No.	Description
1011	1-553-551-12	SWITCH, KEY
1012	1-553-551-22	SWITCH, KEY
1013	1-553-551-32	SWITCH, KEY
1014	1-604-347-00	PRINTED CIRCUIT BOARD, KY-14
1015	1-604-349-00	PRINTED CIRCUIT BOARD, DP-9
1016	1-604-351-00	PRINTED CIRCUIT BOARD, PC-9
1017	1-604-353-00	PRINTED CIRCUIT BOARD, PC-14
1018	3-659-487-00	HOLDER, BUZER
1019	3-659-488-00	PIN, BUZER HOLDER
1020	3-668-028-00	KNOB (SMALL), LEVER SWITCH

No.	Part No.	Description
1021	3-668-123-00	HOLDER, LAMP
1022	3-668-124-00	HOLDER, LED
1023	3-668-151-00	BRACKET, PC14
1024	3-668-327-00	COVER, KEY PANEL
1025	3-668-407-00	NUT, LOCK
1026	3-668-417-00	COVER, PROTECTION, PC9
1027	3-706-480-01	KEY TOP (WHITE)
1028	3-706-480-12	KEY TOP (RED)
1029	3-706-480-22	KEY TOP (BLUE)
1030	3-706-481-01	KEY TOP (WHITE)

No.	Part No.	Description
1031	3-706-481-11	KEY TOP (RED)
1032	3-706-481-22	KEY TOP (BLUD)

### NOTE:

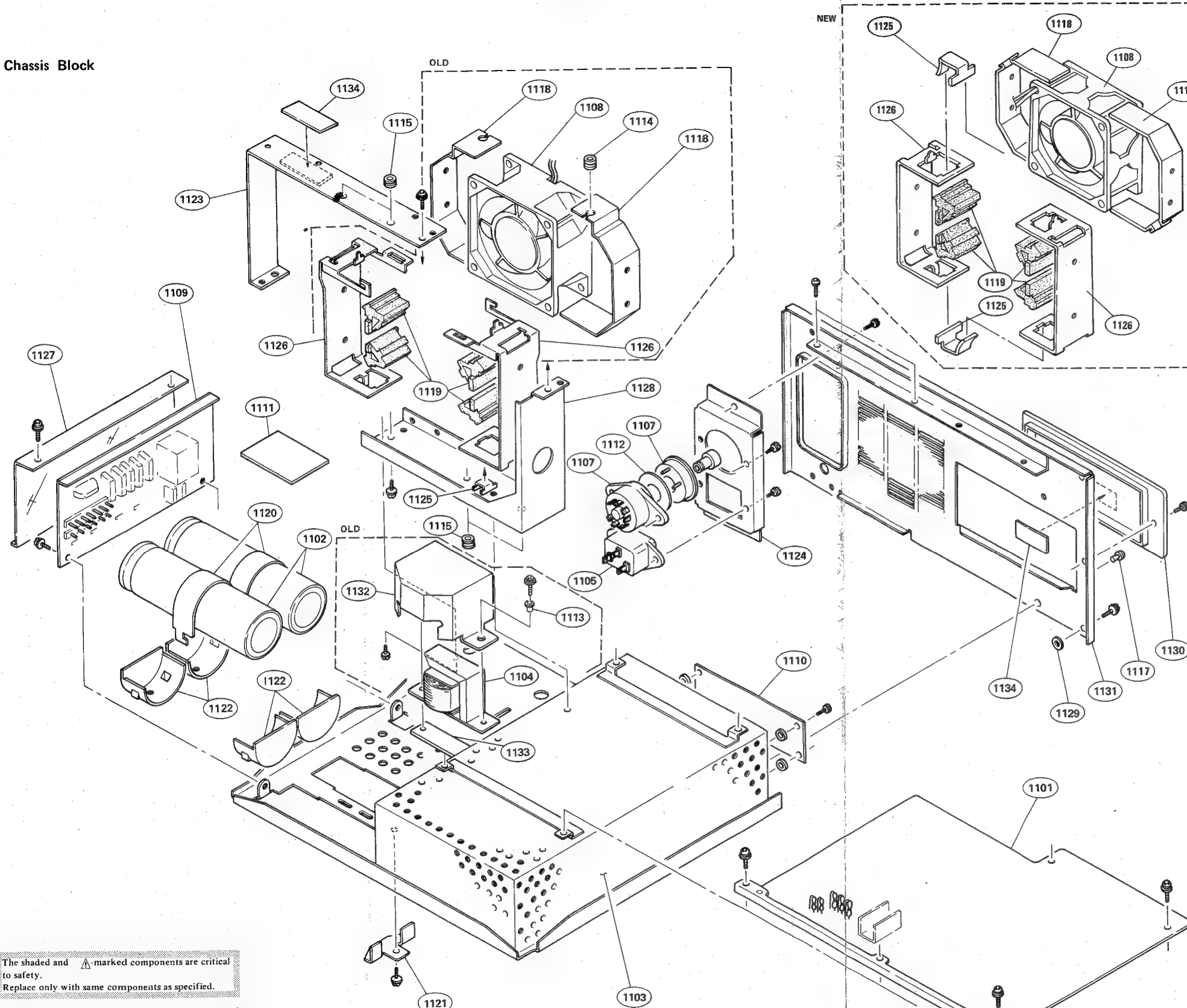
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# Power Chassis Block

## POWER CHASSIS

## POWER CHASSIS



### NOTE:

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- Item with no part number and/or no description are not stocked because they are seldom required for routine service.
- P ..... #11230  
S ..... #10060
- P ..... #11231  
S ..... #10061

No.	Part No.	Description
1131	3-668-422-00	PANEL, PS
1132	3-668-477-00	SHIELD, AUTO TRANSFORMER (SERIAL No. Up to <b>NOTE 4</b> )
1133	3-668-479-00	INSULATOR, BRACKET (SERIAL No. Up to <b>NOTE 4</b> )
1134	3-703-044-26	LABEL, CAUTION

No.	Part No.	Description
1127	3-668-369-00	PROTECTOR, PW
1128	3-668-370-00	FRAME (A), FAN
1129	3-668-413-00	WASHER (M3), STOP
1130	3-688-827-00	COVER, FUSE

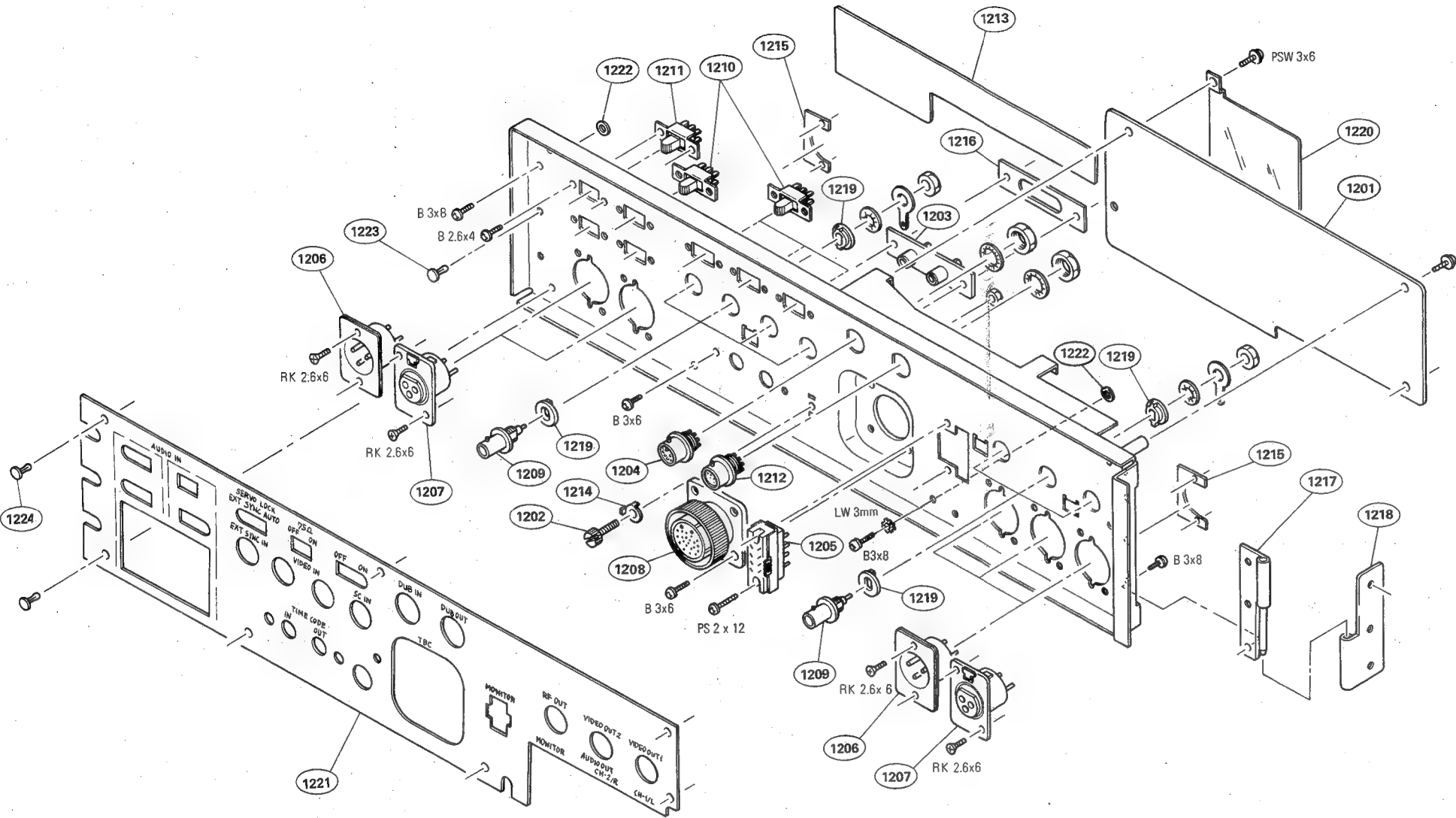
No.	Part No.	Description
<b>A</b> 1101	A-6723-174-C	MOUNTED CIRCUIT BOARD, PD-19
1102	1-125-250-00	<b>C, ELECT 3300MF</b>
<b>A</b> 1103	1-413-071-21	SWITCHING REGULATOR
<b>A</b> 1104	1-446-938-00	<b>TRANSFORMER (FAN, T201)</b> (SERIAL No. Up to <b>NOTE 4</b> )
<b>A</b> 1105	1-509-546-00	<b>3P INLET (AC IN, CN221)</b>
<b>A</b> 1107	1-526-572-00	<b>SOCKET, POWER VOLTAGE SELECT</b>
<b>A</b> 1108	1-541-104-00	<b>BLOWER (FAN, M201)</b> (P ..... S/N Up to 10600) (S ..... S/N Up to 10050)
<b>A</b> 1108	1-541-104-51	<b>BLOWER (FAN, M201)</b> (P ..... S/N 10601 to 11230) (S ..... S/N 10051 to 10060)
1108	1-541-264-11	<b>BLOWER (FAN, M201)</b> (SERIAL No. <b>NOTE 5</b> and higher)
1109	1-604-363-00	PRINTED CIRCUIT BOARD, PW-50 (P ..... S/N Up to 10600) (S ..... S/N Up to 10050)
	1-604-363-16	<b>PRINTED CIRCUIT BOARD, PW-50</b> (P ..... S/N 10601 to 11230) (S ..... S/N 10051 to 10060)
	1-604-363-17	<b>PRINTED CIRCUIT BOARD, PW-50</b> (SERIAL No. <b>NOTE 5</b> and higher)
1110	1-605-936-00	PRINTED CIRCUIT BOARD, FU-16
1111	1-606-043-00	PRINTED CIRCUIT BOARD, RL-14
1112	2-232-802-00	SEAL
1113	2-832-002-00	<b>BUSHING, INSULATING</b> (SERIAL No. Up to <b>NOTE 4</b> )
1114	3-470-019-00	<b>BUSHING, RUBBER</b> (SERIAL No. Up to <b>NOTE 4</b> )
1115	3-564-017-00	<b>CUSHION, MOTOR</b>
1117	3-646-090-11	<b>RIVET, NYLON</b>
1118	3-650-271-00	PLATE, SHIELD, FAN (SERIAL No. Up to <b>NOTE 4</b> )
	3-672-994-01	PLATE, SHIELD, FAN (SERIAL No. <b>NOTE 5</b> and higher)
1119	3-650-272-00	<b>ABSORBER, VIBRATION, FAN</b>
1120	3-668-154-00	BAND, C
1121	3-668-155-00	RETAINER, C
1122	3-668-157-00	RETAINER, C
1123	3-668-158-00	FRAME (B), FAN
1124	3-668-159-00	BRACKET, V.S
1125	3-668-164-00	FASTENER, F
1126	3-668-367-00	HOLDER, FAN (SERIAL No. Up to <b>NOTE 4</b> )
	3-672-995-01	HOLDER, FAN (SERIAL No. <b>NOTE 5</b> and higher)



# CONNECTOR PANEL (1)


# CONNECTOR PANEL (1)

Connector Panel Block (1)



No.	Part No.	Description
1201	A-6713-106-A	MOUNTED CIRCUIT BOARD, AO-3
1202	<b>X-2068-004-0</b>	<b>TERMINAL ASSY</b>
1203	<b>1-507-142-XX</b>	<b>2P PIN JACK (TIME CODE IN/OUT, CN215)</b>
1204	<b>1-508-945-00</b>	<b>RECEPTACLE, 7P (MALE)</b> (DUE IN, CN209)
1205	<b>1-509-095-00</b>	<b>8P MULTI SOCKET (MONITOR, CN207)</b>
1206	<b>1-509-176-00</b>	<b>RECEPTACLE, XLR, (MALE)</b>
1207	<b>1-509-184-00</b>	<b>RECEPTACLE, XLR, (FEMALE)</b>
1208	<b>1-509-471-00</b>	<b>RECEPTACLE, 18P, FEMALE</b> (TBC, CN210)
1209	<b>1-509-891-00</b>	<b>RECEPTACLE, BNC</b> U/C ----- S/N Up to 11375 J ----- S/N Up to 10460 P ----- S/N Up to 11280 S ----- S/N Up to 10060 PM ----- S/N Up to 10020
	<b>1-561-781-21</b>	<b>RECEPTACLE, BNC</b> U/C ----- S/N 11376 and higher J ----- S/N 10461 and higher P ----- S/N 11281 and higher S ----- S/N 10061 and higher PM ----- S/N 10021 and higher
1210	<b>1-516-777-XX</b>	<b>SLIDE SWITCH</b>
1211	<b>1-516-783-XX</b>	<b>SLIDE SWITCH</b>
1212	<b>1-561-045-00</b>	<b>RECEPTACLE, 7P (FEMALE)</b> (DUB OUT, CN208)
1213	1-604-377-00	PRINTED CIRCUIT BOARD, SA-9
1214	<b>2-068-008-00</b>	<b>WASHER</b>
1215	2-232-914-00	PLATE NUT, XLR
1216	3-648-041-00	NUT, PLATE
1217	3-651-651-00	HINGE (A)
1218	3-651-652-00	HINGE (B)
1219	<b>3-654-545-00</b>	<b>SPACER, BNC</b> U/C ----- S/N Up to 11375 J ----- S/N Up to 10460 P ----- S/N Up to 11280 S ----- S/N Up to 10060 PM ----- S/N Up to 10020
1220	3-672-975-00	INSULATOR, AO-3
1221	3-668-381-00	PLATE, ORNAMENTAL, PANEL (FOR U/C, J, P, S)
1221	3-672-916-00	PLATE (PM), ORNAMENTAL, PANEL (FOR PM)
1222	3-668-413-00	WASHER (M3), STOP
1223	<b>3-703-356-00</b>	<b>RIVET, T TYPE</b>
1224	<b>4-812-134-11</b>	<b>RIVET NYLON, 3.5</b>

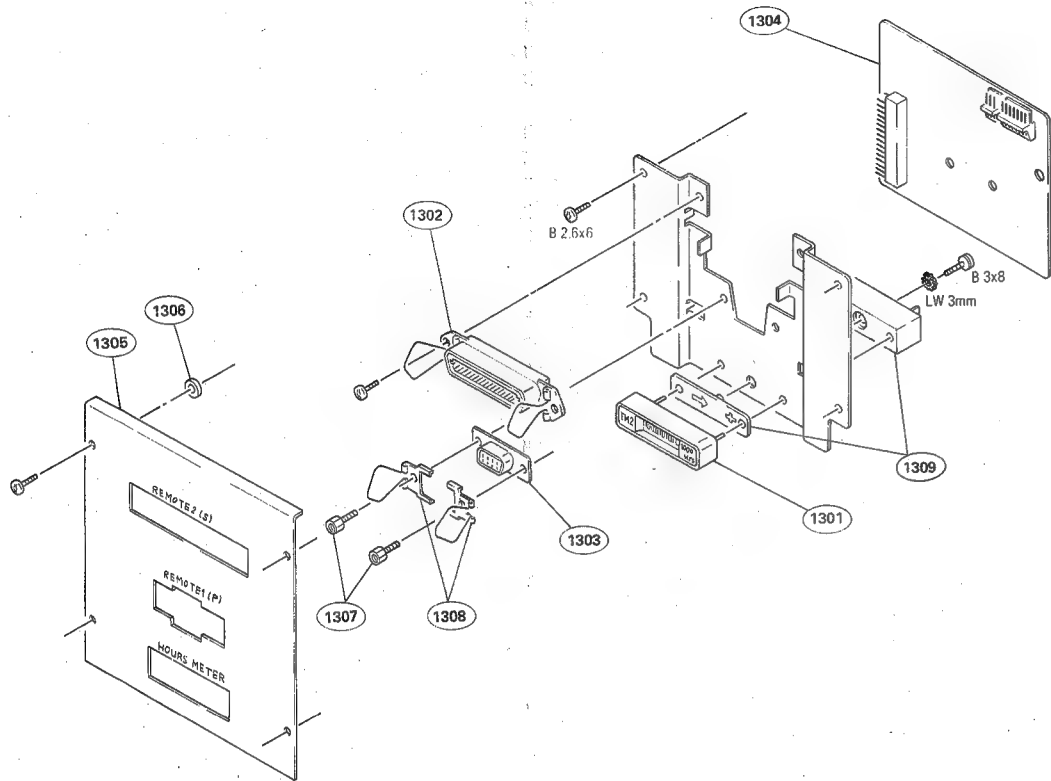
NOTE:

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# CONNECTOR PANEL (2) CHASSIS

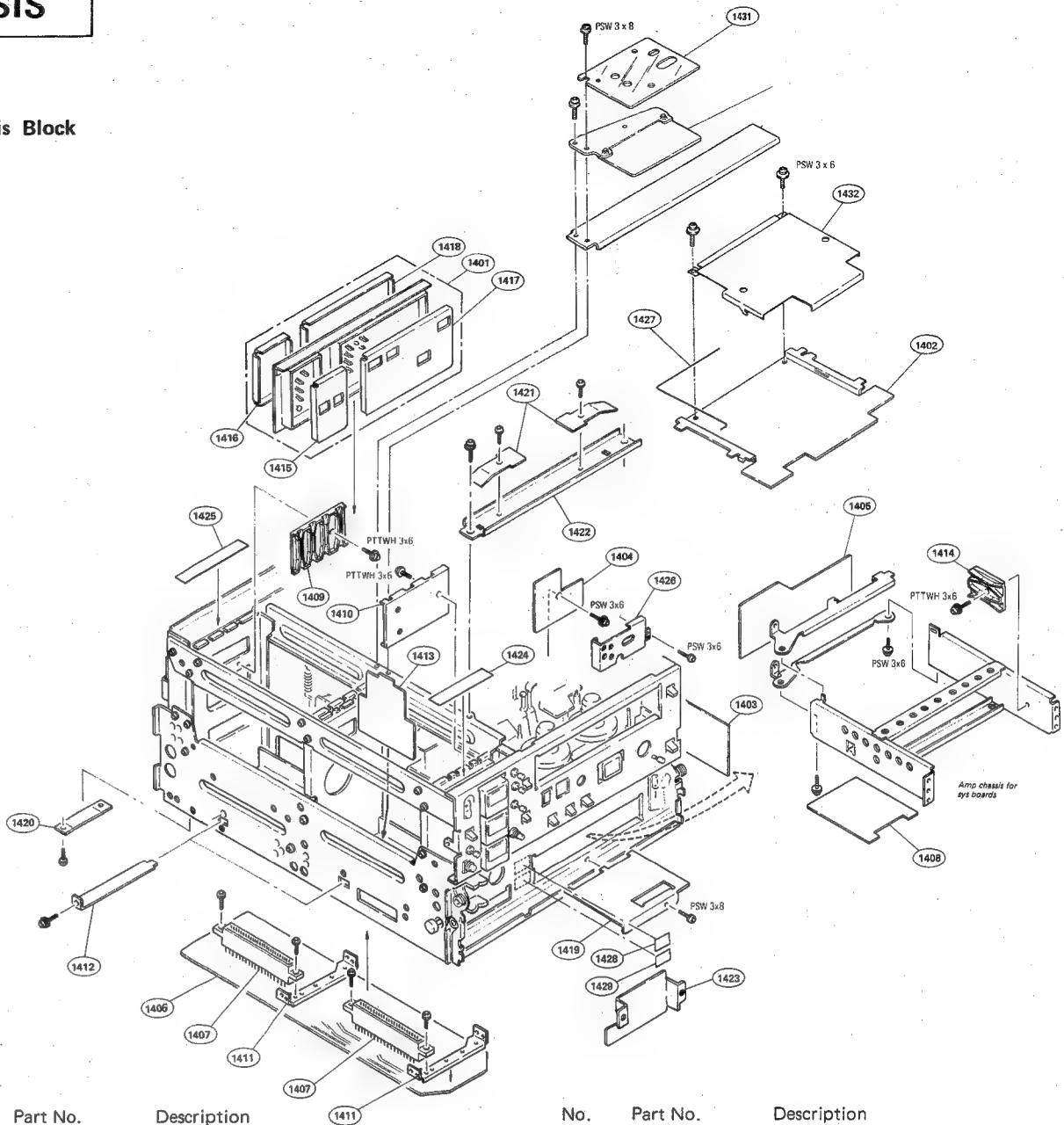
Connector Panel Block (2)



No.	Part No.	Description
1301	1-548-141-41	TIMER (HOURS METER, TM201)
1302	1-561-028-00	CONNECTOR, 36P (REMOTE 2, CN101)
1303	1-563-890-11	CONNECTOR, 9P (REMOTE 1, CN102)
1304	1-604-370-00	PRINTED CIRCUIT BOARD, RM-4
1305	3-668-343-00	PANEL (RIGHT LOWER), CONNECTOR
1306	3-668-413-00	WASHER (M3), STOP
1307	3-668-459-00	SCREW, CONNECTOR
1308	3-668-460-00	SPRING
1309	1-526-829-31	TIMER SOCKET

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Chassis Block



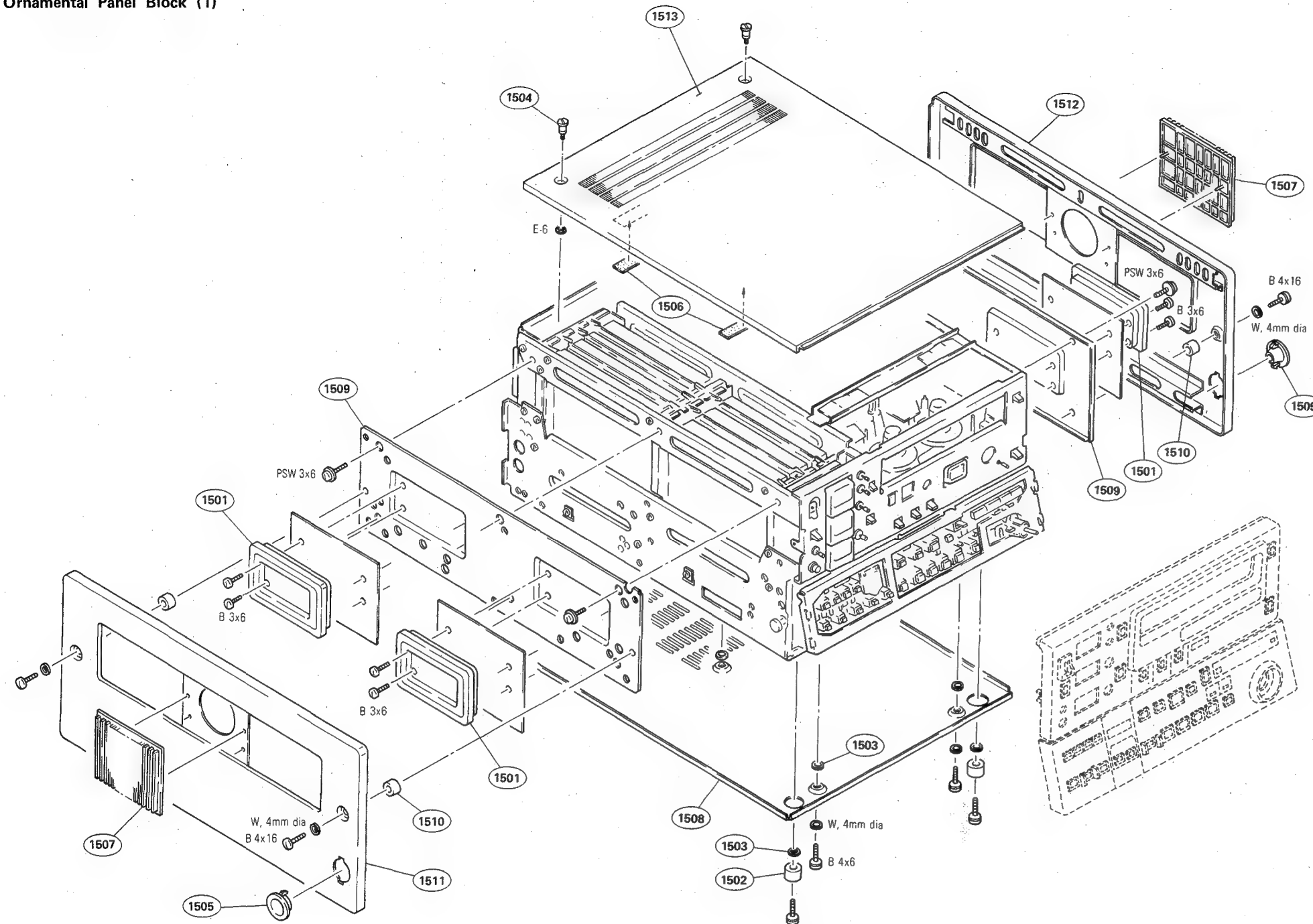
No.	Part No.	Description
1401	A-6711-367-A	MOUNTED CIRCUIT BOARD, RP-10
1402	A-6715-163-A	MOUNTED CIRCUIT BOARD, DT-3
<b>1403</b>	<b>A-6717-208-A</b>	MOUNTED CIRCUIT BOARD, SY-71
1404	A-6725-227-B	MOUNTED CIRCUIT BOARD, RE-3
1405	A-6728-238-A	MOUNTED CIRCUIT BOARD, MB-9
1406	A-6728-536-B	MOUNTED CIRCUIT BOARD, MB-36
1407	1-561-654-00	CONNECTOR, CARD 86P
1408	3-668-119-00	PROTECTOR, MB-9
1409	3-668-129-02	GUIDE (3), PC BOARD
1410	3-668-130-00	GUIDE (4), PC BOARD
1411	3-668-131-02	BRACKET (A), CN
1412	3-668-132-00	BRACKET (B), CN
1413	3-668-133-00	PROTECTOR, MB-8
1414	3-668-134-00	GUIDE (2), PC BOARD
1415	3-668-138-00	COVER, UPPER, SHIELD CASE (A)

No.	Part No.	Description
1416	3-668-139-00	COVER, LOWER, SHIELD CASE (A)
1417	3-668-361-00	COVER, UPPER, SHIELD CASE (B)
1418	3-668-362-00	COVER, LOWER, SHIELD CASE (B)
1419	3-668-423-00	RETAINER (FRONT), FC
1420	3-668-424-00	RETAINER (REAR), FC
<b>1421</b>	<b>3-668-425-00</b>	<b>SPRING</b>
<b>1422</b>	<b>3-668-426-00</b>	<b>STAY, CASSETTE COMPARTMENT</b>
1423	3-668-433-02	COVER, FRONT
1424	3-668-438-00	LABEL (1), PC BOARD
1425	3-668-439-00	LABEL (2), PC BOARD
1426	3-668-440-00	PROTECTOR, RE
1427	3-668-481-00	HOOK, DT PC BOARD
1428	3-668-485-00	LABEL (3), PC BOARD
1429	3-668-486-00	LEBEL (4), PC BOARD
1430	A-6711-423-A	MOUNTED CIRCUIT
1431	3-672-970-00	COVER, FC-10
1432	3-672-974-00	PLATE (B), BLIND
		(P-----S/N 10171 to 10790)
		(S-----S/N 10021 to 10050)




# ORNAMENTAL PANEL (1) ORNAMENTAL PANEL (1)

Ornamental Panel Block (1)



No.	Part No.	Description
1501	X-3642-018-0	HANDLE ASSY
1502	<b>3-642-656-01</b>	<b>FOOT</b>
1503	3-650-537-00	WASHER
1504	<b>3-668-024-00</b>	<b>SCREW, COIN, CABINET</b>
1505	3-668-025-06	ESCUTCHEON, HINGE STOPPER
1506	3-668-026-04	RETAINER, PC
1507	3-668-335-00	ORNAMENT, SIDE PLATE
1508	3-668-375-00	PLATE, BOTTOM
1509	3-668-382-00	BRACKET, HANDLE
1510	3-668-416-00	SPACER, BRACKET, M4
1511	3-668-418-04	PLATE, SIDE, LEFT
1512	3-668-419-04	PLATE, SIDE, RIGHT
1513	3-668-420-04	LID, UPPER
1514	3-703-848-01	LABEL (N) SUB CAUTION (FOR U/C)

## NOTE:

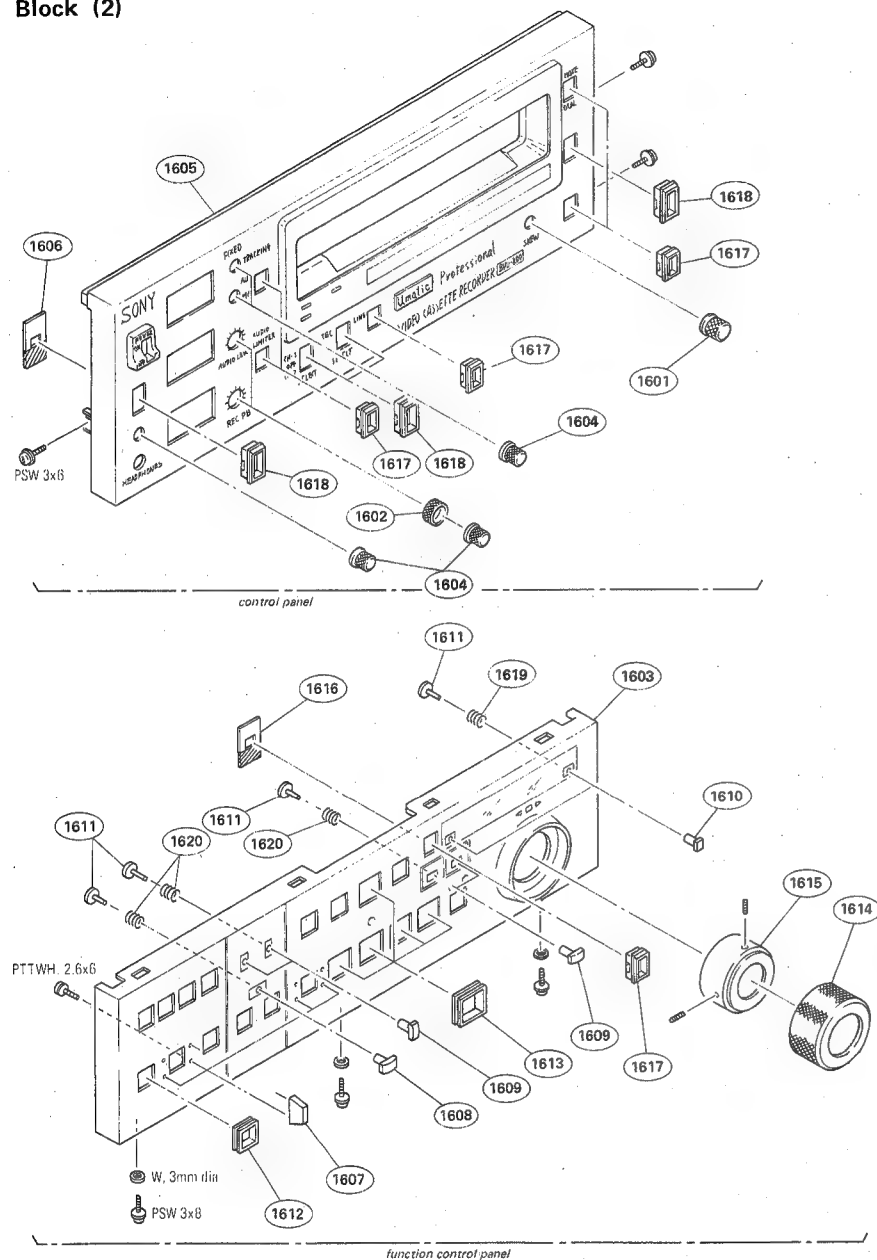
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# ORNAMENTAL PANEL (2)

# PRINTED CIRCUIT BOARD

## Ornamental Panel Block (2)

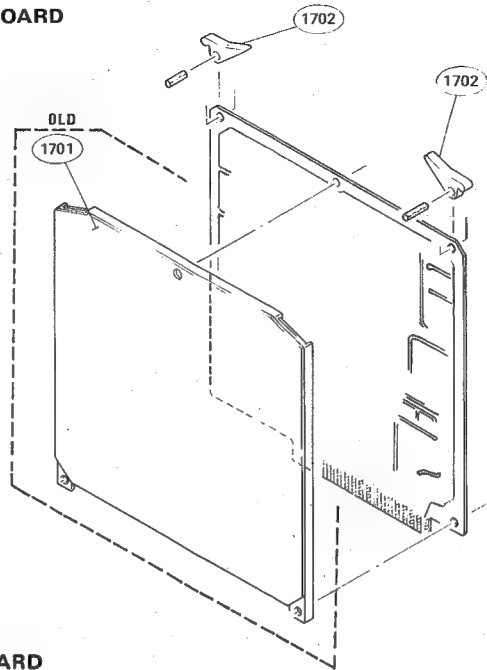


No.	Part No.	Description
1601	X-3651-342-0	KNOB ASSY, CONTROL
1602	X-3668-056-0	KNOB (W) ASSY, CONTROL
1603	X-3668-068-0	PANEL SUB ASSY, KEY
	(P-----S/N Up to 10220)	
	X-3668-068-8	PANEL SUB ASSY, KEY
	(P-----S/N 10221 and higher)	
1604	X-3668-075-0	KNOB ASSY, CONTROL
1605	X-3668-095-0	PANEL SUB ASSY, FRONT
1606	2-252-623-02	PLATE, SWITCH, LEVER
1607	3-657-986-00	GUARD, REC
1608	3-668-006-02	PUSH BUTTON (15x8)
1609	3-668-007-02	PUSH BUTTON (5x9)
1610	3-668-008-02	PUSH BUTTON (3x5)

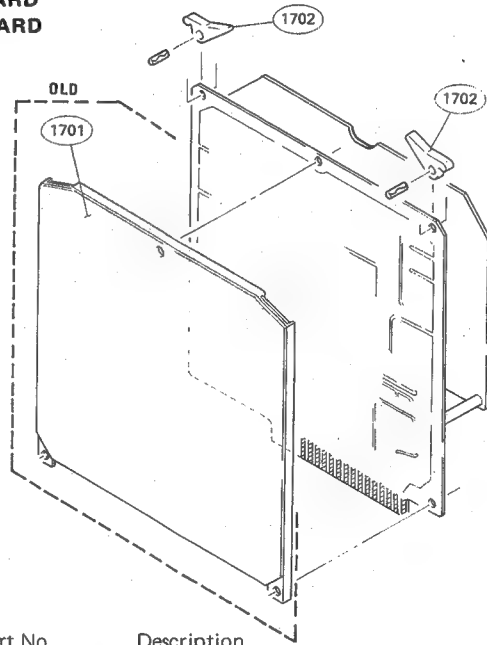
No.	Part No.	Description
1611	3-668-009-02	PIN, PUSH BUTTON
1612	3-668-010-00	ESCUTCHEON (12), BUTTON
	(P-----S/N Up to 10220)	
	3-675-892-00	ESCUTCHEON BUTTON (SMALL)
	(P-----S/N 10221 and higher)	
1613	3-668-011-00	ESCUTCHEON (17), BUTTON
	(P-----S/N Up to 10220)	
	3-675-891-00	ESCUTCHEON BUTTON (LARGE)
	(P-----S/N 10221 and higher)	
1614	3-668-012-00	RUBBER, DIAL KNOB
1615	3-668-013-00	KNOB, DIAL
1616	3-668-015-00	PLATE (SMALL), SWITCH, LEVER
1617	3-668-016-00	FRAME (SMALL), ORNAMENTAL
1618	3-668-018-00	FRAME (MIDDLE), ORNAMENTAL
1619	4-309-349-00	SPRING, COIL

## Printed Circuit Board

### MD-18 BOARD

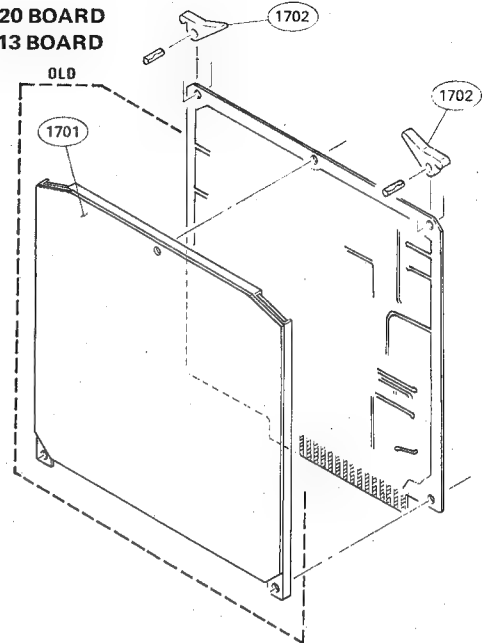


### RS-3 BOARD SV-52 BOARD AU-13 BOARD

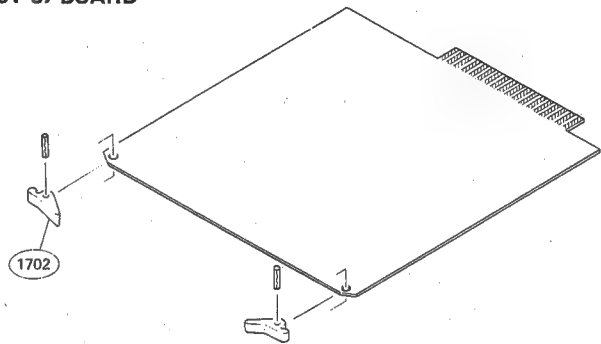


No.	Part No.	Description
1701	X-3668-082-2	CASE ASSY, (A) SHIELD
	(P-----S/N Up to 10650)	
1702	2-251-622-00	LEVER, PC BOARD


### YD-14 BOARD CD-20 BOARD TC-13 BOARD



### SY-92 BOARD SY-37 BOARD

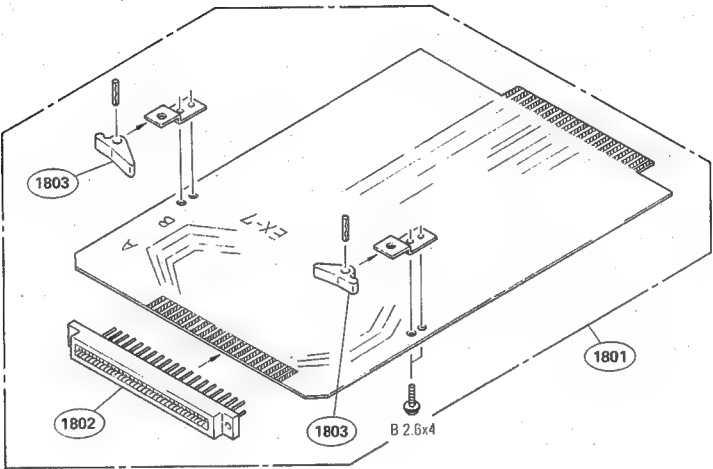


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Supplied Accessory

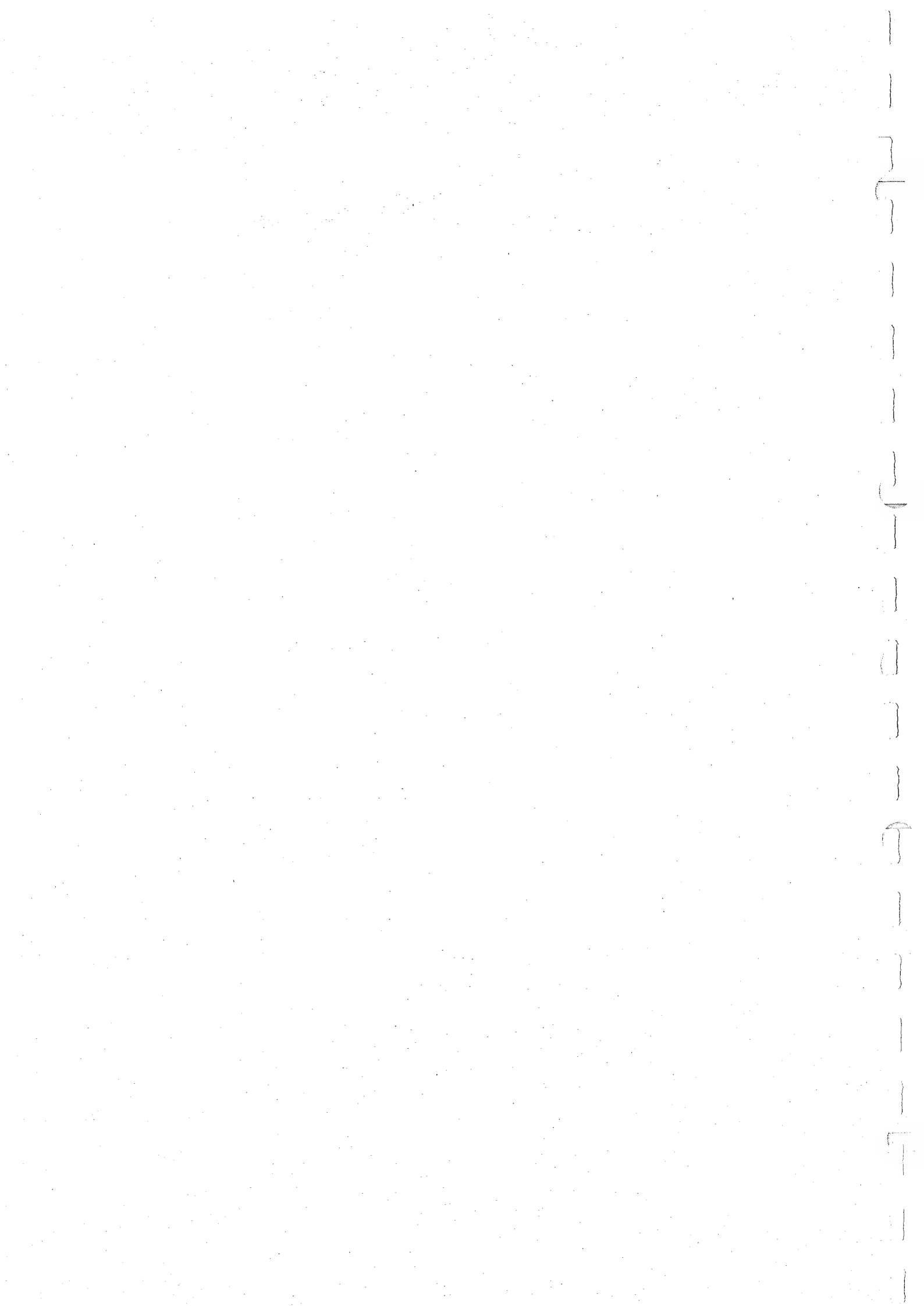


No.	Part No.	Description
1801	<b>A-6724-244-A</b>	<b>EXTENSION BOARD ASSY, EX-7</b>
1802	1-561-654-00	CONNECTOR, CARD 86P
1803	2-251-622-00	LEVER, PC BOARD

NOTE:

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### 18-3. ELECTRICAL PARTS LIST

#### 18-3-1. NOTES FOR ELECTRICAL PARTS LIST

1. The shaded and  $\Delta$ -marked components are critical to safety. Replace only with same component as specified.
2. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in Bold-Face type will be processed, but allow for additional delivery time.
3. **Units of Capacitance, Inductance and Resistance**  
All capacitors are in micro farads unless otherwise specified.  
All inductors are in micro henries unless otherwise specified.  
All resistors are in ohms.
4. **Omitted Parts**  
The following parts are not listed in the "electrical parts list".

REF.	Description/Parts Number	Fig.No.
<b>C</b>	<b>CAPACITOR,SILVERED MICA</b> 1pF through 750pF 500V	Fig.1
	<b>CAPACITOR,CERAMIC</b> 0.001 $\mu$ F through 0.1 $\mu$ F 50V	Fig.2
	<b>CAPACITOR,MYLAR</b> 0.001 $\mu$ F through 0.22 $\mu$ F $\pm$ 5% 50V	Fig.3
	<b>CAPACITOR,ELECT</b> 0.47 $\mu$ F through 470 $\mu$ F 6.3V through 50(63,100)V	Fig.4
	<b>CAPACITOR,TANTALUM</b> 0.01 $\mu$ F through 100 $\mu$ F 3.15V through 35V	Fig.5
<b>CN</b>	<b>CONNECTOR,PCB</b> 3P through 12P	Fig.6
<b>D</b>	<b>DIODE, 1S1555 or 1SS119</b> 8-719-815-55 or 8-719-911-19	
<b>L</b>	<b>INDUCTOR,MICRO</b> 1 $\mu$ H through 33mH $\pm$ 5%	Fig.7
<b>Q</b>	<b>TRANSISTOR,2SC1364</b> 8-729-663-47	
<b>R</b>	<b>RESISTOR,CARBON(1/4W)</b> 1 OHM through 1M OHM $\pm$ 5% 1/4W	Fig.8
	<b>RESISTOR,CARBON(1/8W)</b> 1 OHM through 1M OHM $\pm$ 5% 1/8W	Fig.9
	<b>RESISTOR,METAL</b> 10 OHM through 100k OHM $\pm$ 1% 1/4W	Fig.10

E DADTC

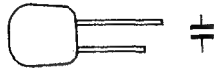


SILVERD MICA, CERAMIC

Fig. 1

SILVERED MICA CAPACITOR

1 pF through 8.2 pF ±0.5 pF 500V  
10 pF through 680 pF ±5% 500V  
750 pF ±10% 500V



Parts No. 1-107-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 pF	019	12 pF	204	51 pF	164	220 pF	177
1.2	039	13	205	56	165	240	178
1.5	040	15	206	62	166	270	179
1.8	041	16	207	68	036	300	180
2.2	042	18	208	75	167	330	181
2.7	043	20	209	82	037	360	182
3.3	044	22	210	91	168	390	183
3.9	045	24	211	100	169	430	184
4.7	046	27	157	110	170	470	185
5.1	026	30	158	120	171	510	186
5.6	047	33	159	130	172	560	187
6.8	048	36	160	150	173	620	188
8.2	049	39	161	160	174	680	212
10	202	43	162	180	175	750	258
11	203	47	163	200	176		

Fig. 2

CERAMIC CAPACITOR

0.001μF through 0.1μF  
50WV



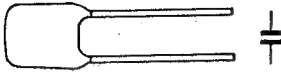
Parts No. 1-161-□□□-00

Value	Parts No. -□□□-	Substitute	Value	Parts No. -□□□-	Substitute
0.001 μF	039	(1-102-074-00)	0.01 μF	051	(1-101-118-00)
0.0012	040		0.012	052	
0.0015	041		0.015	053	
0.0018	042		0.018	054	
0.0022	043	(1-102-100-00)	0.022	055	(1-101-005-00)
0.0027	044		0.027	056	
0.0033	045		0.033	057	
0.0039	046	(1-102-124-00)	0.039	058	
0.0047	047		0.047	059	(1-101-006-00)
0.0056	048		0.056	060	
0.0068	049		0.068	061	
0.0082	050		0.082	062	
			0.1	063	



Fig. 3

## MYLAR CAPACITOR



0.001 $\mu$ F through 0.22 $\mu$ F  
 $\pm$ 5% 50WV

Parts No. 1-108-□□□-00

Value	Parts No. -□□□-
0.001 $\mu$ F	555
0.0011	556
0.0012	557
0.0013	558
0.0015	559
0.0016	560
0.0018	561
0.0020	562
0.0022	563
0.0024	564
0.0027	565
0.0030	566
0.0033	567
0.0036	568
0.0039	569

Value	Parts No. -□□□-
0.0043 $\mu$ F	570
0.0047	571
0.0051	572
0.0056	573
0.0062	574
0.0068	575
0.0075	576
0.0082	577
0.0091	578
0.01	579
0.011	580
0.012	581
0.013	582
0.015	583
0.016	584

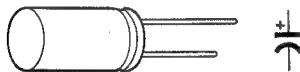
Value	Parts No. -□□□-
0.018 $\mu$ F	585
0.020	586
0.022	587
0.024	588
0.027	589
0.030	590
0.033	591
0.036	592
0.039	593
0.043	594
0.047	595
0.051	596
0.056	597
0.062	598
0.068	599

Value	Parts No. -□□□-
0.075 $\mu$ F	600
0.082	601
0.091	602
0.1	603
0.11	604
0.12	605
0.13	606
0.15	607
0.16	608
0.18	609
0.20	610
0.22	611

Fig. 4

## ELECTROLYTIC CAPACITOR

0.47 $\mu$ F through 470 $\mu$ F  
 6.3WV through 50 (63, 100)WV



Parts No. 1-123-□□□-00

Value	Parts No. -□□□-
0.47 $\mu$ F 50V	
100	379
1	50
100	380
2.2	50
100	381
3.3	25
35	
50	
100	382
4.7	25
35	
50	
63	369
10	10
16	
25	
35	
50	356
22	16
25	330

Value	Parts No. -□□□-
22 $\mu$ F 35V	342
50	
63	371
33	6.3
10	
16	318
25	
35	343
50	
63	372
47	6.3
10	306
16	
25	332
35	
50	359
100	6.3
10	307
16	
25	333
35	345

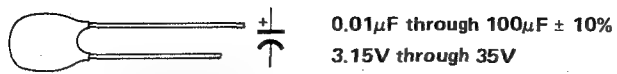
Value	Parts No. -□□□-
100 $\mu$ F 50V	360
220	6.3
10	308
16	321
25	334
35	346
50	361
330	6.3
10	309
16	322
25	335
35	347
50	362
470	6.3
10	310
16	323
25	336
35	348
50	
63	377



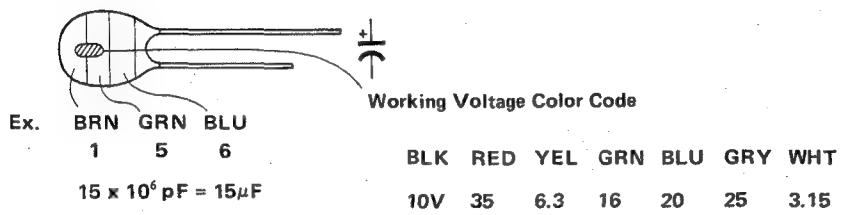
# TANTALUM, CONNECTOR

Fig. 5

## TANTALUM CAPACITOR



NOTE: The value of the parts that are marked by \* in the below table are indicated by color code. (to the value with ±20%)



E. PARTS

Parts No. 1-131-□□□-00					
Value		Parts No. -□□□-		Value	
0.01µ	35V	*396		1.0µ	35V
0.015	35	*397		1.5	6.3
0.022	35	*398			20
0.033	35	*399			25
0.047	35	*400			35
0.068	35	*401		2.2	3.15
0.1	35	341			16
0.15	35	342			20
0.22	35	343			25
0.33	25	*409			35
	35	344		3.3	10
0.47	20	*412			16
	35	345			20
0.68	16	*415			25
	25	*410			35
	35	346		4.7	6.3
1.0	10	*418			10
	25	498			16

Value		Parts No. -□□□-	
4.7µ	20V	363	
	25	357	
	35	351	
6.8	3.15	503	
	6.3	382	
	10	376	
	16	370	
	20	364	
	25	358	
	35	352	
10	3.15	389	
	6.3	383	
	10	377	
	16	371	
	20	365	
	25	359	
	35	353	
15	3.15	390	
	6.3	384	

Value		Parts No. -□□□-	
15µ	10V	378	
	16	372	
	20	366	
	25	360	
22	3.15	391	
	6.3	385	
	10	379	
	16	373	
	20	367	
33	3.15	392	
	6.3	386	
	10	380	
	16	374	
47	3.15	393	
	6.3	387	
	10	381	
68	3.15	394	
	6.3	388	
100	3.15	395	

Fig. 6

## CONNECTOR

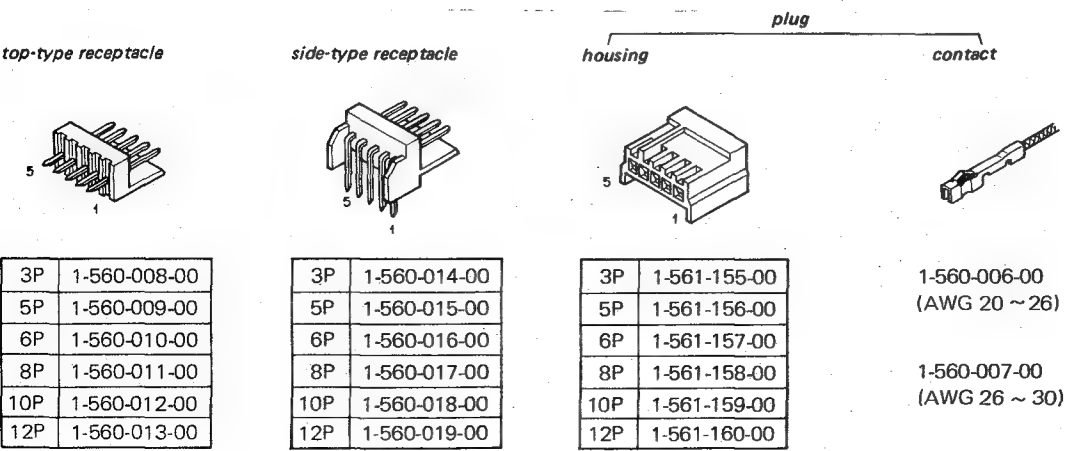
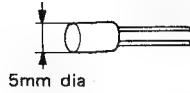




Fig. 7

## MICRO INDUCTOR

1  $\mu$ H through 470  $\mu$ H  
±5%



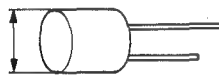
5mm dia

Parts No. 1-407-□□□-XX

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 $\mu$ H	178	4.7 $\mu$ H	186	22 $\mu$ H	161	100 $\mu$ H	169
1.2	179	5.6	187	27	162	120	170
1.5	180	6.8	188	33	163	150	171
1.8	181	8.2	189	39	164	180	172
2.2	182	10	157	47	165	220	173
2.7	183	12	158	56	166	270	174
3.3	184	15	159	68	167	330	175
3.9	185	18	160	82	168	390	176
						470	177

## MICRO INDUCTOR

470  $\mu$ H through 33 mH  
±5%



10mm dia

Parts No. 1-407-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
470 $\mu$ H	488	1.5 mH	494	4.7 mH	500	15 mH	506
560	489	1.8	495	5.6	501	18	507
680	490	2.2	496	6.8	502	22	508
820	491	2.7	497	8.2	503	27	509
1 mH	492	3.3	498	10	504	33	510
1.2	493	3.9	499	12	505		

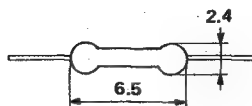


# CARBON (1/4W)

Fig. 8

CARBON RESISTOR (1/4W)

± 5%, 1/4W, non-special type  
1 Ω through 1 MΩ



Parts No. 1-246-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1 Ω	401	33 Ω	437	1 kΩ	473	33 kΩ	509
1.1	402	36	438	1.1	474	36	510
1.2	403	39	439	1.2	475	39	511
1.3	404	43	440	1.3	476	43	512
1.5	405	47	441	1.5	477	47	513
1.6	406	51	442	1.6	478	51	514
1.8	407	56	443	1.8	479	56	515
2	408	62	444	2	480	62	516
2.2	409	68	445	2.2	481	68	517
2.4	410	75	446	2.4	482	75	518
2.7	411	82	447	2.7	483	82	519
3	412	91	448	3.0	484	91	520
3.3	413	100 Ω	449	3.3	485	100 kΩ	521
3.6	414	110	450	3.6	486	110	522
3.9	415	120	451	3.9	487	120	523
4.3	416	130	452	4.3	488	130	524
4.7	417	150	453	4.7	489	150	525
5.1	418	160	454	5.1	490	160	526
5.6	419	180	455	5.6	491	180	527
6.2	420	200	456	6.2	492	200	528
6.8	421	220	457	6.8	493	220	529
7.5	422	240	458	7.5	494	240	530
8.2	423	270	459	8.2	495	270	531
9.1	424	300	460	9.1	496	300	532
10 Ω	425	330	461	10 kΩ	497	330	533
11	426	360	462	11	498	360	534
12	427	390	463	12	499	390	535
13	428	430	464	13	500	430	536
15	429	470	465	15	501	470	537
16	430	510	466	16	502	510	538
18	431	560	467	18	503	560	539
20	432	620	468	20	504	620	540
22	433	680	469	22	505	680	541
24	434	750	470	24	506	750	542
27	435	820	471	27	507	820	543
30	436	910	472	30	508	910	544
						1 MΩ	545



Fig. 9

CARBON RESISTOR (1/8W)

±5%, 1/8W, non-special type  
2.2Ω through 1MΩ

Parts No. 1-246-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
1Ω	-	33Ω	765	1kΩ	783	33kΩ	801
1.1	-	36	826	1.1	844	36	862
1.2	-	39	766	1.2	784	39	802
1.3	-	43	827	1.3	845	43	863
1.5	-	47	767	1.5	785	47	803
1.6	-	51	828	1.6	846	51	864
1.8	-	56	768	1.8	786	56	804
2	-	62	829	2	847	62	865
2.2	751	68	769	2.2	787	68	805
2.4	812	75	830	2.4	848	75	866
2.7	752	82	770	2.7	788	82	806
3	813	91	831	3.0	849	91	867
3.3	753	100Ω	771	3.3	789	100kΩ	807
3.6	814	110	832	3.6	850	110	868
3.9	754	120	772	3.9	790	120	808
4.3	815	130	833	4.3	851	130	869
4.7	755	150	773	4.7	791	150	809
5.1	816	160	834	5.1	852	160	870
5.6	756	180	774	5.6	792	180	810
6.2	817	200	835	6.2	853	200	871
6.8	757	220	775	6.8	793	220	811
7.5	818	240	836	7.5	854		
8.2	758	270	776	8.2	794		
9.1	819	300	837	9.1	855		
10Ω	759	330	777	10kΩ	795		
11	820	360	838	11	856		
12	760	390	778	12	796		
13	821	430	839	13	857		
15	761	470	779	15	797		
16	822	510	840	16	858		
18	762	560	780	18	798		
20	823	620	841	20	859		
22	763	680	781	22	799		
24	824	750	842	24	860		
27	764	820	782	27	800		
30	825	910	843	30	861		

Parts No. 1-247-□□□-00

Value	Parts No. -□□□-
240kΩ	054
270	046
300	055
330	047
360	056
390	048
430	057
470	049
510	058
560	050
620	059
680	051
750	060
820	052
910	061
1MΩ	053

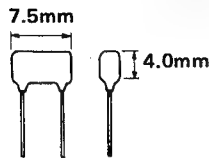


METAL (1/4W)

Fig. 10

METAL FILM RESISTOR

± 1%, 1/4W  
10Ω through 100kΩ



Parts No. 1-214-□□□-00

Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-	Value	Parts No. -□□□-
10Ω	084	100Ω	108	1.0kΩ	132	10kΩ	156
11	085	110	109	1.1	133	11	157
12	086	120	110	1.2	134	12	158
13	087	130	111	1.3	135	13	159
15	088	150	112	1.5	136	15	160
16	089	160	113	1.6	137	16	161
18	090	180	114	1.8	138	18	162
20	091	200	115	2.0	139	20	163
22	092	220	116	2.2	140	22	164
24	093	240	117	2.4	141	24	165
27	094	270	118	2.7	142	27	166
30	095	300	119	3.0	143	30	167
33	096	330	120	3.3	144	33	168
36	097	360	121	3.6	145	36	169
39	098	390	122	3.9	146	39	170
43	099	430	123	4.3	147	43	171
47	100	470	124	4.7	148	47	172
51	101	510	125	5.1	149	51	173
56	102	560	126	5.6	150	56	174
62	103	620	127	6.2	151	62	175
68	104	680	128	6.8	152	68	176
75	105	750	129	7.5	153	75	177
82	106	820	130	8.2	154	82	178
91	107	910	131	9.1	155	91	179
						100	180

E. PARTS

ABBREVIATIONS

Ref. No.	Description	Ref. No.	Description	Ref. No.	Description
C□□, CV□□	CAPACITOR	IC□□	IC	R□□, RV□□	RESISTOR
CN□□	CONNECTOR	L□□, LV□□	INDUCTOR	RY□□	RELAY
CP□□	COMBINATION PARTS	M□□	MOTOR	S□□	SWITCH
D□□	DIODE	ME□□	METER	SB□□	SOLAR BATTERY
DL□□	DELAY LINE	PL□□	LAMP	T□□	TRANSFORMER
F□□	FUSE	PM□□	SOLENOID	TH□□	THERMISTOR
FL□□	FILTER	Q□□	TRANSISTOR	X□□	CRYSTAL
H□□	HEAD				



# AO-2, AO-3, AU-13 (AU-25)

Ref. No.	Parts No.	Description
<b>AO-2 BOARD</b>		
	1-604-375-00	PRINTED CIRCUIT BOARD, AO-2

S1	1-516-963-00	LEVER SLIDE "AUDIO MONITOR"
----	--------------	--------------------------------

Ref. No.	Parts No.	Description
RV1	1-224-251-XX	VAR, METAL 4.7K
RV2	1-224-251-XX	VAR, METAL 4.7K
RV3	1-224-251-XX	VAR, METAL 4.7K

T1	1-423-225-00	INPUT/OUTPUT
T2	1-423-225-00	INPUT/OUTPUT
T3	1-423-225-00	INPUT/OUTPUT

<b>AO-3 BOARD</b>		
	A-6713-106-A	MOUNTED CIRCUIT BOARD, AO-3

D1	8-719-200-02	10E-2
D2	8-719-200-02	10E-2
D3	8-719-200-02	10E-2

FL1	1-235-030-00	LOWPASS
FL2	1-235-030-00	LOWPASS

IC1	8-751-701-13	CX-170-13 (SONY)
IC2	8-751-701-13	CX-170-13 (SONY)
IC3	8-751-701-13	CX-170-13 (SONY)
IC4	8-720-002-97	TX-429D (SONY)
IC5	8-720-002-97	TX-429D (SONY)

Q1	8-760-335-10	2SC1474
Q2	8-760-335-10	2SC1474
Q3	8-760-335-10	2SC1474
Q4	8-729-612-77	2SA1027R
Q5	8-729-201-04	2SC2878

Q6	8-729-612-77	2SA1027R
Q7	8-729-201-04	2SC2878
Q8	8-729-612-77	2SA1027R
Q9	8-729-201-04	2SC2878

R1	1-244-861-00	CARBON 330 5% 1/2W
----	--------------	--------------------

<b>AU-13 BOARD</b>		
	A-6713-018-C	MOUNTED CIRCUIT BOARD, AU-13 (WITH AU-25)

C8	1-130-491-00	MYLAR 0.047 5% 50V
C20	1-130-491-00	MYLAR 0.047 5% 50V
C21	1-130-491-00	MYLAR 0.047 5% 50V
C40	1-102-114-00	CERAMIC 470PF 10% 50V
C84	1-102-112-00	CERAMIC 330P 10% 50V

C108	1-130-491-00	MYLAR 0.047 5% 50V
C120	1-130-491-00	MYLAR 0.047 5% 50V
C121	1-130-491-00	MYLAR 0.047 5% 50V
C140	1-102-114-00	CERAMIC 470PF 10% 50V
C503	1-129-714-00	FILM 0.01 10% 630V

C514	1-129-712-00	FILM 0.0068 10% 630V
C517	1-129-712-00	FILM 0.0068 10% 630V
C520	1-129-708-00	FILM 0.0033 10% 630V
C521	1-109-169-00	MICA 910PF 5% 300V
C522	1-109-169-00	MICA 910PF 5% 300V

C600	1-102-114-00	CERAMIC 470PF 10% 50V
C603	1-102-114-00	CERAMIC 470PF 10% 50V
C604	1-102-114-00	CERAMIC 470PF 10% 50V

D9	8-719-162-07	RD6.2E-B
D10	8-719-101-97	1SS97-1
D109	8-719-162-07	RD6.2E-B
D110	8-719-101-97	1SS97-1
D208	8-719-162-07	RD6.2E-B

D501	8-719-200-02	10E-2
D502	8-719-200-02	10E-2

FL1	1-235-030-00	LOWPASS
FL101	1-235-030-00	LOWPASS



# AU-13 (AU-25)

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
IC1	8-759-276-17	TA7617AP (TOSHIBA)	Q7	8-729-201-04	2SC2878
IC2	8-720-002-97	TX-429D-7 (SONY)	Q9	8-729-201-04	2SC2878
IC3	8-720-002-97	TX-429D-7 (SONY)	Q11	8-729-177-43	2SD774
IC4	8-720-002-97	TX-429D-7 (SONY)	Q12	8-729-374-02	2SB740
IC5	8-759-145-58	μPC4558C (RC4558; RAYTHEON)	Q101	8-729-201-04	2SC2878
IC101	8-759-276-17	TA7617AP (TOSHIBA)	Q102	8-729-612-77	2SA1027R
IC102	8-720-002-97	TX-429D-7 (SONY)	Q103	8-729-201-04	2SC2878
IC103	8-720-002-97	TX-429D-7 (SONY)	Q104	8-729-201-04	2SC2878
IC104	8-720-002-97	TX-429D-7 (SONY)	Q106	8-729-201-04	2SC2878
IC201	8-759-240-71	TC4071BP (CD4071BE; RCA)	Q107	8-729-201-04	2SC2878
IC202	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q109	8-729-201-04	2SC2878
IC203	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q201	8-729-612-77	2SA1027R
IC204	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q202	8-729-612-77	2SA1027R
IC205	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q203	8-729-612-77	2SA1027R
IC206	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q204	8-729-612-77	2SA1027R
IC207	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q205	8-729-612-77	2SA1027R
IC208	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q206	8-729-612-77	2SA1027R
IC209	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	Q503	8-761-622-00	2SC1636
IC601	8-759-345-38	HD14538BP (MC14538BCP; MOT)	Q504	8-729-612-77	2SA1027R
IC602	8-759-240-30	TC4030BP (CD4030BE; RCA)	Q505	8-729-177-43	2SD774
IC603	8-759-240-71	TC4071BP (CD4071BE; RCA)	Q506	8-729-612-77	2SA1027R
IC604	8-759-240-81	TC4081BP (CD4081BE; RCA)	Q507	8-729-177-43	2SD774
IC605	8-759-345-38	HD14538BP (MC14538BCP; MOT)	Q508	8-729-177-43	2SD774
IC606	8-759-240-13	TC4013BP (CD4013BE; RCA)	Q509	8-729-177-43	2SD774
			Q510	8-729-177-44	2SD774-5
L1	1-407-519-00	FERRITE CORE, 7T	Q511	8-729-177-43	2SD774
L101	1-407-519-00	FERRITE CORE, 7T	Q512	8-729-177-43	2SD774
			Q513	8-729-177-44	2SD774-5
			Q514	8-729-177-43	2SD774
			Q515	8-729-177-43	2SD774
LV1	1-409-295-00	VAR, 22mH	Q516	8-729-177-44	2SD774-5
LV2	1-409-295-00	VAR, 22mH	Q517	8-729-177-43	2SD774
LV3	1-407-288-00	VAR, 4.7mH	Q518	8-729-177-43	2SD774
LV101	1-409-295-00	VAR, 22mH	Q601	8-729-384-48	2SA844
LV102	1-409-295-00	VAR, 22mH			
LV103	1-407-288-00	VAR, 4.7mH			
LV501	1-407-286-00	VAR, 2.2mH	R94	1-244-861-00	CARBON 330 5% 1/2W
LV502	1-407-284-00	VAR, 1mH	R95	1-244-861-00	CARBON 330 5% 1/2W
LV503	1-407-284-00	VAR, 1mH	R511	1-244-817-00	CARBON 4.7 5% 1/2W
LV504	1-407-283-00	VAR, 0.68mH	R523	1-244-825-00	CARBON 10 5% 1/2W
LV505	1-407-283-00	VAR, 0.68mH	R525	1-244-833-00	CARBON 22 5% 1/2W
LV506	1-407-282-00	VAR, 0.47mH			
			R531	1-244-825-00	CARBON 10 5% 1/2W
			R532	1-244-833-00	CARBON 22 5% 1/2W
Q1	8-729-201-04	2SC2878	R539	1-244-825-00	CARBON 10 5% 1/2W
Q2	8-729-612-77	2SA1027R	R540	1-244-825-00	CARBON 10 5% 1/2W
Q3	8-729-201-04	2SC2878			
Q4	8-729-201-04	2SC2878			
Q6	8-729-201-04	2SC2878			

E. PARTS



# AU-13 (AU-25), CC-9, CC-10, CC-11, CD-20

Ref. No.	Parts No.	Description
RV1	1-224-254-XX	VAR, METAL 47K
RV2	1-224-253-XX	VAR, METAL 22K
RV3	1-224-254-XX	VAR, METAL 47K
RV4	1-224-253-XX	VAR, METAL 22K
RV5	1-224-250-XX	VAR, METAL 2.2K
RV6	1-224-134-XX	VAR, METAL 470K
RV7	1-224-248-XX	VAR, METAL 470 (S/N Up to 10400)
RV101	1-224-254-XX	VAR, METAL 47K
RV102	1-224-253-XX	VAR, METAL 22K
RV103	1-224-254-XX	VAR, METAL 47K
RV104	1-224-253-XX	VAR, METAL 22K
RV105	1-224-250-XX	VAR, METAL 2.2K
RV106	1-224-134-XX	VAR, METAL 470K
RV107	1-224-248-XX	VAR, METAL 470 (S/N Up to 10400)
RV202	1-224-255-XX	VAR, METAL 100K
RV203	1-224-255-XX	VAR, METAL 100K
RV204	1-224-255-XX	VAR, METAL 100K
RV205	1-224-255-XX	VAR, METAL 100K
RV206	1-224-255-XX	VAR, METAL 100K
RV207	1-224-255-XX	VAR, METAL 100K
RV208	1-224-255-XX	VAR, METAL 100K
RV209	1-224-255-XX	VAR, METAL 100K
RV501	1-224-247-XX	VAR, METAL 100
RV502	1-224-247-XX	VAR, METAL 100
RY501	1-515-475-00	12V, 280 OHM
RY502	1-515-475-00	12V, 280 OHM
T1	1-427-562-11	INPUT/OUTPUT
T2	1-427-284-00	OUTPUT
T101	1-427-562-11	INPUT/OUTPUT
T102	1-427-284-00	OUTPUT
T501	1-433-195-00	OSC.
T502	1-433-196-00	BIAS
T503	1-433-196-00	BIAS
T504	1-433-196-00	BIAS
TH1	1-800-200-00	S-3K
TH101	1-800-200-00	S-3K

Ref. No.	Parts No.	Description
<b>CC-9 BOARD</b>		
	1-604-429-00	PRINTED CIRCUIT BOARD, CC-9
<b>CC-10 BOARD</b>		
	1-604-430-00	PRINTED CIRCUIT BOARD, CC-10
IC1	8-719-140-05	PS4005 (NEC)
<b>CC-11 BOARD</b>		
	1-604-431-00	PRINTED CIRCUIT BOARD, CC-11
IC2	8-719-140-05	PS4005 (NEC)
<b>CD-20 BOARD</b>		
	A-6711-370-A	MOUNTED CIRCUIT BOARD, CD-20
C16	1-102-759-00	CERAMIC 62PF UJ 5% 50V

E PARTS



Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
C120	1-109-555-00	DIPPED MICA 560PF 5% 100V	LV501	1-407-573-00	VAR 47
C122	1-109-160-00	DIPPED MICA 390PF 5% 300V			
C132	1-109-557-00	DIPPED MICA 680PF 5% 100V	Q1	8-729-384-47	2SA844-D
C133	1-109-557-00	DIPPED MICA 680PF 5% 100V	Q2	8-729-201-04	2SC2878
C160	1-107-026-00	MICA 5.1PF 500V	Q3	8-724-375-01	2SC403C
			Q4	8-724-375-01	2SC403C
CV1	1-141-167-00	TRIMMER 18PF	Q5	8-729-384-47	2SA844-D
CV2	1-141-167-00	TRIMMER 18PF			
			Q8	8-729-201-04	2SC2878
D1	8-719-815-59	1S1555-S	Q9	8-729-201-04	2SC2878
D203	8-719-101-97	1SS97-1	Q12	8-724-375-01	2SC403C
D204	8-719-101-97	1SS97-1	Q13	8-724-375-01	2SC403C
D402	8-719-104-10	1SS99	Q15	8-724-375-01	2SC403C
			Q16	8-724-375-01	2SC403C
DL2	1-415-096-31	0.3 $\mu$ S	Q25	8-729-201-04	2SC2878
			Q102	8-724-375-01	2SC403C
FL1	1-235-011-00	LOW PASS (S/N. up to 10790)	Q109	8-724-375-01	2SC403C
	1-235-011-21	LOW PASS (S/N. 10791 and higher)	Q111	8-729-113-32	2SB733
FL2	1-231-382-00	BANDPASS	Q201	8-724-375-01	2SC403C
FL101	1-231-377-00	BANDPASS (S/N. up to 10790)	Q202	8-725-412-00	2SC1124
	1-231-377-21	BANDPASS (S/N. 10791 and higher)	Q203	8-725-412-00	2SC1124
			Q204	8-724-375-01	2SC403C
IC1	8-751-300-00	CX-130 (SONY)	Q205	8-724-375-01	2SC403C
IC2	8-758-720-00	CX-872 (SONY)	Q301	8-724-375-01	2SC403C
IC3	8-751-300-00	CX-130 (SONY)	Q302	8-724-375-01	2SC403C
IC101	8-759-200-60	TA7060AP (TOSHIBA)	Q303	8-724-375-01	2SC403C
IC104	8-759-245-28	TC4528BP (MC14528BCP; MOTOROLA)	Q304	8-729-384-47	2SA844-D
			Q305	8-729-384-47	2SA844-D
IC105	8-759-908-59	CX-859 (SONY)	Q306	8-724-375-01	2SC403C
IC106	8-759-245-28	TC4528BP (MC14528BCP; MOTOROLA)	Q308	8-724-375-01	2SC403C
IC201	8-759-200-60	TA7060AP (TOSHIBA)	Q309	8-724-375-01	2SC403C
IC202	8-749-938-80	BX-388 (SONY)	Q310	8-724-375-01	2SC403C
IC303	8-759-240-01	TC4001BP (CD4001BE; RCA)	Q311	8-724-375-01	2SC403C
IC401	8-759-270-76	TA7076P (TOSHIBA)	Q312	8-724-375-01	2SC403C
IC402	8-759-145-58	$\mu$ PC4558C (RC4558C; RAYTHEON)	Q313	8-729-384-47	2SA844-D
IC403	8-759-145-58	$\mu$ PC4558C (RC4558C; RAYTHEON)	Q316	8-729-384-47	2SA844-D
IC405	8-759-045-38	MC14538BCP (MOTOROLA)	Q401	8-724-375-01	2SC403C
IC406	8-759-969-13	SN16913P (TI)	Q402	8-723-303-20	2SK43-3A
IC501	8-751-300-00	CX-130 (SONY)	Q403	8-729-201-04	2SC2878
IC502	8-759-969-13	SN16913P (TI)	Q404	8-729-201-04	2SC2878
			Q405	8-729-201-04	2SC2878
			Q406	8-724-375-01	2SC403C
			Q501	8-724-375-01	2SC403C
L306	1-407-167-61	MICRO 68 $\mu$ H	Q502	8-724-375-01	2SC403C
			Q503	8-729-663-47	2SC1364
			R21	1-212-718-00	METAL 470K 1/2W 1%
			R220	1-244-835-00	CARBON 27 1/2W 5%
			R221	1-244-835-00	CARBON 27 1/2W 5%
			R422	1-244-866-00	CARBON 510 1/2W 5%



Ref. No.	Parts No.	Description
RV1	1-224-251-XX	VAR, METAL 4.7K
RV2	1-224-253-XX	VAR, METAL 22K
RV5	1-224-253-XX	VAR, METAL 22K
RV7	1-224-252-XX	VAR, METAL 10K
RV8	1-228-892-00	VAR, METAL 22K
RV102	1-224-252-XX	VAR, METAL 10K
RV103	1-224-252-XX	VAR, METAL 10K
RV104	1-224-251-XX	VAR, METAL 4.7K
RV105	1-224-253-XX	VAR, METAL 22K
RV106	1-224-251-XX	VAR, METAL 4.7K
RV107	1-224-249-XX	VAR, METAL 1K
RV108	1-224-252-XX	VAR, METAL 10K
RV109	1-224-252-XX	VAR, METAL 10K
RV110	1-224-253-XX	VAR, METAL 22K
RV201	1-224-660-21	VAR, METAL 1K
RV202	1-224-252-XX	VAR, METAL 10K
RV203	1-224-249-XX	VAR, METAL 1K
RV301	1-226-773-00	VAR, METAL 22K
RV302	1-226-775-00	VAR, METAL 100K
RV399	1-224-550-21	VAR, METAL 220
RV401	1-224-250-XX	VAR, METAL 2.2K
RV404	1-224-255-XX	VAR, METAL 100K
RV406	1-224-253-XX	VAR, METAL 22K

T1 1-425-880-21 BURST AMP

X1 1-527-345-00 OSC 4.43MHz

#### DA-6 BOARD

**NOTE:** The DA-6 board is mounted on the upper drum assembly, and the dynamic balance adjustment of the whole upper drum assembly is performed in the factory. Therefore DA-6 mounted circuit board and upper drum assembly cannot be replaced individually, the whole upper drum assembly must be replaced when DA-6 board fails.

D11	8-719-900-95	V09G
D12	8-719-139-27	RD39EB4Z
D13	8-719-139-27	RD39EB4Z
D14	8-719-900-95	V09G
D21	8-719-900-95	V09G
D22	8-719-139-27	RD39EB4Z
D23	8-719-139-27	RD39EB4Z
D24	8-719-900-95	V09G

Ref. No.	Parts No.	Description
IC11	8-743-944-00	BX-3944 (SONY)
IC21	8-743-944-00	BX-3944 (SONY)
Q11	8-724-375-01	2SC403C
Q21	8-724-375-01	2SC403C
T1	1-423-251-00	RF INPUT
T2	1-423-251-00	RF INPUT

#### DT-3-1 BOARD

A-6715-163-A MOUNTED CIRCUIT BOARD,  
DT-3-1

D6	8-719-162-07	RD6.2EB
D12	8-719-982-04	ERB81-004
D26	8-719-162-07	RD6.2EB
D27	8-719-815-59	1S1555-S
D28	8-719-911-19	1SS119
IC1	8-759-245-16	TC4516BP (MC14516BCP; MOTOROLA)
IC2	8-759-245-16	TC4516BP (MC14516BCP; MOTOROLA)
IC3	8-759-040-77	MC14077BCP (CD4077BE; RCA)
IC4	8-759-240-25	TC4025BP (CD4025BE; RCA)
IC5	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC6	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC7	8-759-045-84	MC14584BCP (MOTOROLA)
IC8	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC9	8-759-240-82	TC4082BP (CD4082BE; RCA)
IC12	8-759-240-73	TC4073BP (CD4073BE; RCA)
IC13	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC14	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC15	8-759-240-71	TC4071BP (CD4071BE; RCA)
IC16	8-759-240-75	TC4075BP (CD4075BE; RCA)
IC17	8-759-145-28	μPD4528C (MC14528BCP; MOTOROLA)
IC18	8-759-345-38	HD14538BP (MC14538BCP; MOTOROLA)
IC20	8-759-345-38	HD14538BP (MC14538BCP; MOTOROLA)
IC21	8-759-240-29	TC4029BP (CD4029BE; RCA)
IC22	8-759-240-29	TC4029BP (CD4029BE; RCA)
IC24	8-759-240-24	TC4024BP (CD4024BE; RCA)



Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
IC25	8-759-240-43	TC4043BP (CD4043BE; RCA)	IC65	8-759-240-27	TC4027BP (CD4027BE; RCA)
IC26	8-759-045-85	MC14585BCP (TC4585BP; TOSHIBA)	IC66	8-759-240-40	TC4040BP (CD4040BE; RCA)
IC27	8-759-241-74	TC40174BP (MC14174BCP; MOTOROLA)	IC67	8-759-645-17	M54517P (MITSUBISHI)
IC28	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC68	8-759-921-91	TL191CN (TI)
IC29	8-759-045-85	MC14585BCP (TC4585BP; TOSHIBA)	IC69	8-759-241-74	TC40174BP (MC14174BCP; MOTOROLA)
IC30	8-759-240-81	TC4081BP (CD4081BE; RCA)	IC70	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC31	8-759-040-46	MC14046BCP (CD4046BE; RCA)	IC71	8-759-045-38	MC14538BCP (MOTOROLA)
IC32	8-759-045-26	MC14526BCP (MOTOROLA)	IC72	8-759-241-74	TC40174BP (MC14174BCP; MOTOROLA)
IC33	8-759-240-29	TC4029BP (CD4029BE; RCA)	IC73	8-759-132-40	$\mu$ PC324C (LM324; NSC)
IC34	8-759-240-18	TC4018BP (CD4018BE; RCA)	IC74	8-759-240-13	TC4013BP (TOSHIBA)
IC35	8-759-240-18	TC4018BP (CD4018BE; RCA)	IC75	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC36	8-759-240-18	TC4018BP (CD4018BE; RCA)	IC76	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC37	8-759-045-26	MC14526BCP (MOTOROLA)	IC77	8-759-240-75	TC4075BP (CD4075BE; RCA)
IC38	8-759-240-51	TC4051BP (CD4051BE; RCA)	IC78	8-759-045-84	MC14584BCP (MOTOROLA)
IC39	8-759-045-51	MC14551BCP (MOTOROLA)	IC79	8-759-045-84	MC14584BCP (MOTOROLA)
IC40	8-759-241-74	TC40174BP (MC14174BCP; MOTOROLA)	Q2	8-729-603-30	2SC403SP
IC41	8-759-240-13	TC4013BP (TOSHIBA)	Q3	8-729-603-30	2SC403SP
IC42	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q4	8-724-375-01	2SC403C
IC43	8-759-132-40	$\mu$ PC324C (LM324; NSC)			
IC44	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R31	1-247-855-00	CARBON 10 5% 1/6W
IC45	8-759-145-58	$\mu$ PC4558C (RC4558; RAYTHEON)			
IC46	8-759-132-40	$\mu$ PC324C (LM324; NSC)	RV1	1-226-772-00	VAR, METAL 4.7K
IC47	8-759-132-40	$\mu$ PC324C (LM324; NSC)	RV2	1-226-772-00	VAR, METAL 4.7K
IC48	8-759-132-40	$\mu$ PC324C (LM324; NSC)	RV3	1-226-772-00	VAR, METAL 4.7K
IC49	8-759-729-01	NJM2901N (JRC)	RV4	1-226-771-00	VAR, METAL 1K
IC50	8-759-921-91	TL191CN (TI)	RV5	1-226-775-00	VAR, METAL 100K
IC51	8-759-921-91	TL191CN (TI)			
IC52	8-759-921-91	TL191CN (TI)	RV7	1-226-776-00	VAR, METAL 220K
IC53	8-759-145-58	$\mu$ PC4558C (RC4558; RAYTHEON)	RV8	1-226-776-00	VAR, METAL 220K
IC54	8-759-132-40	$\mu$ PC324C (LM324; NSC)	RV9	1-226-772-00	VAR, METAL 4.7K
IC55	8-759-132-40	$\mu$ PC324C (LM324; NSC)	RV10	1-226-772-00	VAR, METAL 4.7K
IC56	8-759-132-40	$\mu$ PC324C (LM324; NSC)	RV11	1-226-772-00	VAR, METAL 4.7K
IC57	8-759-645-17	M54517P (MITSUBISHI)			
IC58	8-759-240-69	TC4069UBP (CD4069UBE; RCA)	RV12	1-226-772-00	VAR, METAL 4.7K
IC59	8-759-240-11	TC4011BP (CD4011BE; RCA)	RV13	1-226-775-00	VAR, METAL 100K
IC60	8-759-240-66	TC4066BP (CD4066BE; RCA)	RV14	1-226-775-00	VAR, METAL 100K
IC61	8-759-245-20	TC4520BP (MC14520BCP; MOTOROLA)	RV15	1-226-703-00	VAR, METAL 10K
IC62	8-759-145-28	$\mu$ PD4528C (MC14528BCP; MOTOROLA)	RV16	1-226-703-00	VAR, METAL 10K
IC63	8-759-045-38	MC14538BCP (MOTOROLA)	RV19	1-226-776-00	VAR, METAL 220K
IC64	8-759-240-29	TC4029BP (CD4029BE; RCA)	RV20	1-226-774-00	VAR, METAL 47K
			SW1	1-552-509-00	DIP
			SW2	1-552-509-00	DIP



# DV-3, EK-2, EK-3, EM-1, FC-10, FU-16, HP-5

Ref. No. Parts No. Description

## DV-3 BOARD

1-605-756-00 PRINTED CIRCUIT BOARD,  
DV-3 (BRUSH)

## EK-2 BOARD

1-604-354-00 PRINTED CIRCUIT BOARD,  
EK-2

IC1 8-719-140-05 PS4005 (NEC)

## EK-3 BOARD

1-604-355-00 PRINTED CIRCUIT BOARD,  
EK-3

IC1 8-719-140-05 PS4005 (NEC)

## EM-1 BOARD

A-6748-123-B DME ASS'Y EM-1

### NOTE:

DME 1 and DME 2 are precisely calibrated their physical position on EM-1 board in the factory by precision fixture. Do not replace only DME 1 or DME 2. Replace the entire DME ASS'Y EM-1, A-6748-123-B.

## FC-10 BOARD

MOUNTED CIRCUIT BOARD,  
FC-10

IC1 8-751-300-00 CX130 (SONY)  
IC2 8-759-324-11 HA12411 (HITACHI)  
IC3 8-749-909-15 BX3915A (SONY)  
IC4 8-759-240-30 TC4030BP (CD4030BE; RCA)  
IC5 8-759-345-38 HD14538BP (HITACHI)  
  
IC6 8-759-240-13 TC4013BP (TOSHIBA)  
IC7 8-759-240-11 TC4011BP (CD4011BE; RCA)

Q1 8-729-612-77 2SA1027R  
Q2 8-724-375-01 2SC403C  
Q3 8-724-375-01 2SC403C

R1 1-247-217-00 CARBON 110 5% 1/2W

RV1 1-224-255-XX VAR, METAL 100K

Ref. No. Parts No. Description

## FU-16 BOARD

1-605-936-00 PRINTED CIRCUIT BOARD,  
FU-16

1-533-037-XX HOLDER, FUSE

F3 1-532-614-00 0.25A (TIME LAG)

F4 1-532-614-00 0.25A (TIME LAG)

F5 1-532-325-00 6.3A (TIME LAG)

F6 1-532-299-00 5A (TIME LAG)

F7 1-532-325-00 6.3A (TIME LAG)

F8 1-532-299-00 5A (TIME LAG)

## HP-5 BOARD

1-604-378-00 PRINTED CIRCUIT BOARD,  
HP-5

CN1 1-507-553-00 JACK "HEADPHONES"

RV1 1-228-218-00 VAR, CARBON 500x2



# KY-9 (KY-14, DP-9)

Ref. No. Parts No. Description

## KY-9 BOARD

A-6717-205-A MOUNTED CIRCUIT BOARD,  
KY-9 (WITH KY-14, DP-9)  
1-604-347-00 PRINTED CIRCUIT BOARD,  
KY-14  
1-604-349-00 PRINTED CIRCUIT BOARD,  
DP-9

C3 1-102-108-00 CERAMIC 150PF 10% 50V  
C4 1-102-119-00 CERAMIC 0.0015 10% 50V  
C6 1-102-114-00 CERAMIC 470PF 10% 50V  
C7 1-102-112-00 CERAMIC 330PF 10% 50V  
C11 1-102-114-00 CERAMIC 470PF 10% 50V  
  
C12 1-102-114-00 CERAMIC 470PF 10% 50V  
C13 1-102-113-00 CERAMIC 390PF 10% 50V  
C14 1-102-114-00 CERAMIC 470PF 10% 50V  
C25 1-102-110-00 CERAMIC 220PF 10% 50V

CN4 1-560-454-00 40P

D2 8-719-904-55 GL-5HD5  
D3 8-719-904-55 GL-5HD5  
D4 8-719-904-55 GL-5HD5  
D5 8-719-904-55 GL-5HD5  
D6 8-719-904-55 GL-5HD5  
  
D7 8-719-803-21 TLR321  
D8 8-719-803-21 TLR321  
D9 8-719-803-21 TLR321  
D10 8-719-803-21 TLR321

IC1 8-759-900-05 SN74LS05N (TI)  
IC2 8-759-171-05  $\mu$ PC7805H (NEC)  
IC3 8-759-645-17 M54517P (MITSUBISHI)  
IC4 8-759-240-99 TC4099BP (CD4099BE; RCA)  
IC5 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
  
IC6 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC7 8-759-241-61 TC40161BP (CD40161BE; RCA)  
IC8 8-759-045-84 MC14584BCP (MOTOROLA)  
IC9 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC10 8-759-240-15 TC4015BP (CD4015BE; RCA)  
  
IC11 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC12 8-759-245-16 TC4516BP (MC14516BCP; MOT)  
IC13 8-759-245-28 TC4528BP (MC14528BCP; MOT)  
IC14 8-759-240-01 TC4001BP (CD4001BE; RCA)  
IC15 8-759-240-13 TC4013BP (CD4013BE; RCA)

Ref. No. Parts No. Description

IC16 8-759-240-13 TC4013BP (CD4013BE; RCA)  
IC17 8-759-240-11 TC4011BP (CD4011BE; RCA)  
IC18 8-759-240-11 TC4011BP (CD4011BE; RCA)  
IC19 8-759-045-84 MC14584BCP (MOTOROLA)  
IC20 8-759-240-30 TC4030BP (CD4030BE; RCA)  
  
IC21 8-759-240-30 TC4030BP (CD4030BE; RCA)  
IC22 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC23 8-759-240-99 TC4099BP (CD4099BE; RCA)  
IC24 8-759-645-17 M54517P (MITSUBISHI)  
IC25 8-759-240-99 TC4099BP (CD4099BE; RCA)  
  
IC26 8-759-245-12 TC4512BP (MC14512BCP; MOT)  
IC27 8-759-645-17 M54517P (MITSUBISHI)  
IC28 8-759-645-17 M54517P (MITSUBISHI)  
IC29 8-759-901-56 SN74LS156N (TI)  
IC31 8-759-100-64  $\mu$ PA64H (NEC)  
  
IC32 8-759-100-54  $\mu$ PA54H (NEC)  
IC33 8-759-100-54  $\mu$ PA54H (NEC)  
IC34 8-759-100-64  $\mu$ PA64H (NEC)

PL1 1-518-386-00 5V, 30mA  
PL2 1-518-386-00 5V, 30mA  
PL3 1-518-386-00 5V, 30mA

Q1 8-729-374-02 2SB740  
Q2 8-729-374-02 2SB740  
Q3 8-729-374-02 2SB740  
Q4 8-729-374-02 2SB740  
Q5 8-729-374-02 2SB740  
  
Q6 8-729-374-02 2SB740  
Q7 8-729-374-02 2SB740  
Q8 8-729-374-02 2SB740

R1 1-212-502-00 METAL 51 1% 1/2W  
R2 1-212-502-00 METAL 51 1% 1/2W  
R3 1-212-502-00 METAL 51 1% 1/2W  
R4 1-212-502-00 METAL 51 1% 1/2W  
R42 1-212-502-00 METAL 51 1% 1/2W  
  
R43 1-212-502-00 METAL 51 1% 1/2W  
R44 1-212-502-00 METAL 51 1% 1/2W  
R45 1-212-502-00 METAL 51 1% 1/2W  
R46 1-212-502-00 METAL 51 1% 1/2W  
R47 1-212-502-00 METAL 51 1% 1/2W

E. PARTS



## ΕΡΩΤΗΣΕΙΣ

Ref. No.	Parts No.	Description
R48	1-212-502-00	METAL 51 1% 1/2W
R49	1-212-502-00	METAL 51 1% 1/2W
R50	1-212-502-00	METAL 51 1% 1/2W
R51	1-212-502-00	METAL 51 1% 1/2W
R52	1-212-502-00	METAL 51 1% 1/2W
R53	1-212-502-00	METAL 51 1% 1/2W
R54	1-212-502-00	METAL 51 1% 1/2W
R55	1-212-502-00	METAL 51 1% 1/2W
R56	1-212-502-00	METAL 51 1% 1/2W
S1	1-554-318-11 1-518-450-31 3-706-480-01	KEY "ASSEMBLE" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S2	1-554-318-11 1-518-450-31 3-706-480-01	KEY "VIDEO INS" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S3	1-554-318-11 1-518-450-31 3-706-480-01	KEY "AUDIO 1 INS" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S4	1-554-318-11 1-518-450-31 3-706-480-01	KEY "AUDIO 2 INS" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S5	1-554-318-11 1-518-450-31 3-706-480-01	KEY "PREROLL" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S6	1-554-318-11 1-518-450-31 3-706-480-01	KEY "PREVIEW" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S7	1-554-318-21 1-518-450-31 3-706-480-11	KEY "AUTO EDIT" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (RED)
S8	1-554-318-11 1-518-450-31 3-706-480-01	KEY "REVIEW" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S9	1-554-318-11 1-518-450-31 3-706-480-01	KEY "IN" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S10	1-554-318-11 1-518-450-31 3-706-480-01	KEY "OUT" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S11	1-554-318-11 1-518-450-31 3-706-480-01	KEY "STANDBY" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S12	1-553-551-21 1-518-450-21 3-706-481-11	KEY "REC" 17 SQUARE PILOT LAMP 5V 60mA KEY TOP (RED)
S13	1-554-318-11 1-518-450-31 3-706-480-01	KEY "EDIT" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)
S14	1-554-318-11 1-518-450-31 3-706-480-21	KEY "EJECT" 12 SQUARE PILOT LAMP 5V 60mA KEY TOP (BLUE)
S15	1-553-551-11 1-518-450-21 3-706-481-01	KEY "REW" 17 SQUARE PILOT LAMP 5V 60mA KEY TOP (WHITE)

Ref. No.	Parts No.	Description
S16	1-553-551-11	KEY "PLAY" 17 SQUARE
	1-518-450-21	PILOT LAMP 5V 60mA
	3-706-481-01	KEY TOP (WHITE)
S17	1-553-551-11	KEY "FF" 17 SQUARE
	1-518-450-21	PILOT LAMP 5V 60mA
	3-706-481-01	KEY TOP (WHITE)
S18	1-553-551-32	KEY "STOP" 17 SQUARE
	1-518-450-21	PILOT LAMP 5V 60mA
	3-706-481-21	KEY TOP (BLUE)
S19	1-554-318-11	KEY "SEARCH" 12 SQUARE
	1-518-450-31	PILOT LAMP 5V 60mA
	3-706-480-01	KEY TOP (WHITE)
S20	1-516-994-00	LEVER SLIDE "VIDEO"
S21	1-552-539-00	KEY "TRIM -"
S22	1-552-539-00	KEY "TRIM +"
S23	1-552-539-00	KEY "ENTRY"
S24	1-552-539-00	KEY "LAP"
S25	1-552-539-00	KEY "RESET"
S26	1-552-539-00	KEY "PLAYER"
S27	1-552-539-00	KEY "RECORDER"

## LV-1 BOARD

	1-604-371-00	PRINTED CIRCUIT BOARD, LV:1
<b>S1</b>	<b>1-516-994-00</b>	<b>LEVER SLIDE "VIDEO LEVEL"</b>

## MB-9 BOARD

A-6728-238-A MOUNTED CIRCUIT BOARD, MB-9		
CN51	1-561-654-00	86P
CN52	1-561-654-00	86P
CN53	1-555-700-00	WIRE ASS'Y, FLAT 34P (370mm)
CN54	1-560-547-00	40P



# PD-19 (PD-15, PD-17, PD-21, DR-9, DR-19, BP-6)

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
C101	1-109-577-00	MICA 680PF 5% 500V	Q207	8-763-420-00	2SC1762
C201	1-109-577-00	MICA 680PF 5% 500V	Q208	8-765-141-00	2SA911
C332	1-109-582-00	MICA 0.0011 5% 500V	Q209	8-765-141-00	2SA911
	1-109-587-00	MICA 0.0018 5% 500V	Q210	8-765-141-00	2SA911
C365	1-161-025-00	CERAMIC 0.1 25V	Q212	8-729-384-48	2SA844
CP301	1-464-139-00	OSC.	Q301	8-729-374-72	2SA747
D53	8-719-900-95	V09G	Q302	8-729-374-72	2SA747
D54	8-719-900-95	V09G	Q304	8-729-177-43	2SD774
D55	8-719-900-95	V09G	Q305	8-729-103-43	2SB734
D56	8-719-900-95	V09G	Q306	8-729-168-11	2SC2681
D301	8-719-151-07	RD5.1E-B	Q307	8-729-311-62	2SC1116
D302	8-719-911-55	U05G	Q308	8-729-177-43	2SD774
D305	8-759-112-88	RD12F-B	Q309	8-729-103-43	2SB734
D306	8-719-102-07	RD2.0E	Q310	8-729-168-11	2SC2681
D311	8-719-200-02	10E-2	Q311	8-729-311-62	2SC1116
D312	8-719-113-07	RD13E-B	Q312	8-723-302-00	2SK43-2
D313	8-719-113-07	RD13E-B	Q313	8-729-177-43	2SD774
D314	8-719-200-02	10E-2	Q314	8-729-374-02	2SB740
IC101	8-759-145-58	μPC4558C (RC4558; RAYTHEON)	Q315	8-729-331-53	2SC2315
IC301	8-759-145-58	μPC4558C (RC4558; RAYTHEON)	Q317	8-729-377-12	2SA771
IC303	8-759-979-12	μA7912UC (FSC)	Q318	8-729-168-11	2SC2681
IC304	8-759-145-58	μPC4558C (RC4558; RAYTHEON)	Q319	8-729-168-11	2SC2681
IC305	8-759-645-17	M54517P (MITSUBISHI)	Q320	8-729-374-02	2SB740
Q52	8-729-384-48	2SA844	Q321	8-729-201-04	2SC2878
Q53	8-763-420-00	2SC1762	Q323	8-729-374-02	2SB740
Q54	8-765-141-00	2SA911	Q324	8-729-114-11	2SA1141
Q101	8-765-141-00	2SA911	Q325	8-729-177-43	2SD774
Q102	8-765-141-00	2SA911	Q326	8-729-168-11	2SC2681
Q103	8-763-420-00	2SC1762	Q331	8-729-374-02	2SB740
Q104	8-763-420-00	2SC1762	Q332	8-729-612-77	2SA1027R
Q105	8-763-420-00	2SC1762	Q333	8-729-612-77	2SA1027R
Q106	8-763-420-00	2SC1762	Q336	8-729-374-02	2SB740
Q107	8-763-420-00	2SC1762	Q340	8-729-612-77	2SA1027R
Q108	8-765-141-00	2SA911	Q341	8-729-374-02	2SB740
Q109	8-765-141-00	2SA911	Q342	8-729-177-43	2SD774
Q110	8-765-141-00	2SA911	R6	1-217-159-00	METAL 0.68 5W 10%
Q112	8-729-384-48	2SA844	R13	1-217-159-00	METAL 0.68 5W 10%
Q201	8-765-141-00	2SA911	R53	1-247-224-00	CARBON 220 1/2W 5%
Q202	8-765-141-00	2SA911	R56	1-247-224-00	CARBON 220 1/2W 5%
Q203	8-763-420-00	2SC1762	R109	1-244-925-00	CARBON 150K 1/2W 5%
Q204	8-763-420-00	2SC1762	R110	1-244-925-00	CARBON 150K 1/2W 5%
Q205	8-763-420-00	2SC1762	R114	1-224-925-00	CARBON 150K 1/2W 5%
Q206	8-763-420-00	2SC1762	R122	1-206-670-00	METAL 1.8K 2W 5%
			R209	1-244-925-00	CARBON 150K 1/2W 5%
			R210	1-244-925-00	CARBON 150K 1/2W 5%
			R214	1-244-925-00	CARBON 150K 1/2W 5%
			R222	1-206-670-00	METAL 1.8K 2W 5%



# PD-19 (PD-15, PD-17, PD-21, DR-9, DR-19, BP-6), PR-33, PW-50

Ref. No.	Parts No.	Description
R311	1-207-619-00	WIREWOUND 0.82 3W 10%
R326	1-212-372-00	METAL 10 1W 10%
R328	1-213-131-00	METAL 100 1W 5%
R332	1-212-352-00	METAL 0.22 1W 5%
R333	1-212-352-00	METAL 0.22 1W 5%

 R334 1-217-465-00 FUSIBLE 0.47 1W 10%

R350	1-213-131-00	METAL 100 1W 5%
R372	1-247-180-00	CARBON 1 1/2W 5%
R373	1-244-844-00	CARBON 62 1/2W 5%

RV1	1-224-249-XX	VAR, METAL 1K
RV2	1-224-249-XX	VAR, METAL 1K

## PR-33 BOARD

1-604-511-00 PRINTED CIRCUIT BOARD,  
PR-33

S1 1-516-994-00 LEVER SLIDE "REMOTE 1/2"

Ref. No. Parts No. Description

PW-50 BOARD ----- (S/N. Up to 10600 (PAL)  
(S/N. Up to 10050 (SECAM))

 1-604-363-00 PRINTED CIRCUIT BOARD,  
PW-50

 1-533-037-XX HOLDER, FUSE

 C1 1-130-160-00 FILM 0.22 20% 250V

 C2 1-161-744-00 CERAMIC 0.01 400V

 C3 1-161-743-00 CERAMIC 0.0047 400V

 C4 1-161-743-00 CERAMIC 0.0047 400V

 C5 1-161-743-00 CERAMIC 0.0047 400V

 C6 1-161-743-00 CERAMIC 0.0047 400V

C7 1-125-250-00 ELECT 3300 200V

C8 1-125-250-00 ELECT 3300 200V

 C9 1-161-743-00 CERAMIC 0.0047 20% 400V

 C10 1-161-743-00 CERAMIC 0.0047 20% 400V

 C11 1-161-743-00 CERAMIC 0.0047 20% 400V


 C12 1-161-743-00 CERAMIC 0.0047 20% 400V

 C13 1-161-744-00 CERAMIC 0.01 400V



Ref. No.	Parts No.	Description
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 CN151	1-560-033-00	3P
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 CN152	1-560-033-00	3P
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 CN153	1-560-034-00	6P
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 CN154	1-560-034-00	6P
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 CN155	1-560-008-00	3P
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D1	8-719-911-55	U05G
D2	8-719-911-55	U05G
D3	8-719-911-55	U05G
D4	8-719-911-55	U05G
D5	8-719-200-02	10E-2


 F1	1-532-350-00	4A
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 F2	1-532-634-00	10A, 150°C
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 R1	1-217-632-00	WIREWOUND 10 5% 10W
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R3	1-244-929-00	CARBON 220K 5% 1/2W
R4	1-244-929-00	CARBON 220K 5% 1/2W


 RY1	1-515-357-00	12V 75mA
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 T1	1-421-457-00	LINE FILTER
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Ref. No.	Parts No.	Description
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**PW-50 BOARD** ----- (S/N. 10601 and higher (PAL)  
(S/N. 10051 and higher (SECAM))

 1-604-363-16	PRINTED CIRCUIT BOARD, PW-50 (S/N. 10601 to 11230 (PAL) (S/N. 10051 to 10060 (SECAM))
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 1-604-363-17	PRINTED CIRCUIT BOARD, PW-50 (S/N. 11231 and higher (PAL) (S/N. 10061 and higher (SECAM))
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 1-533-037-00	HOLDER, FUSE
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 C1	1-130-160-00	MYLAR 0.22 20% 250V
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 C2	1-161-744-00	MYLAR 0.01 20% 250V
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 C3	1-161-741-00	CERAMIC 0.001 10% 400V
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 C4	1-161-741-00	CERAMIC 0.001 10% 400V
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 C5	1-161-741-00	CERAMIC 0.001 10% 400V
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 C6	1-161-741-00	CERAMIC 0.001 10% 400V
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C7	1-125-250-00	ELECT 3300 200V
C8	1-125-250-00	ELECT 3300 200V

 C9	1-161-953-00	CERAMIC 0.0047 20% 400V
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 C10	1-161-953-00	CERAMIC 0.0047 20% 400V
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 C11	1-161-953-00	CERAMIC 0.0047 20% 400V
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 C12	1-161-953-00	CERAMIC 0.0047 20% 400V
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 C13	1-161-744-00	MYLAR 0.01 20% 250V
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C14	1-131-371-00	TANTALUM 10 16V
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# PW-50, PW-79

E. PARTS

Ref. No.	Parts No.	Description
△ CN151	1-560-033-00	3P
△ CN152	1-560-033-00	3P
△ CN153	1-560-034-00	6P
△ CN154	1-560-034-00	6P (S/N. Up to 11230 (P)) (S/N. Up to 10060 (S))

D1	8-719-911-55	U05G
D2	8-719-911-55	U05G
D3	9-719-911-55	U05G
D4	8-719-911-55	U05G
D5	8-719-200-02	10E-2
D6	8-719-815-55	1S1555

△ F1	1-532-350-00	4A
△ F2	1-532-634-00	10A, 150°C

△ PH1	1-519-244-00	NEON PHOTO COUPLER
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Q1	8-729-663-47	2SC1364
Q2	8-729-177-43	2SD774

△ R1	1-217-632-00	WIREWOUND 10 10% 10W
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R3	1-244-929-00	CARBON 220K 5% 1/2W
R4	1-244-929-00	CARBON 220K 5% 1/2W
R5	1-247-276-00	CARBON, NONFLAMABLE 33K 5% 1/2W
R11	1-247-266-00	CARBON, NONFLAMABLE 12K 5% 1/2W
R12	1-247-284-00	CARBON, NONFLAMABLE 68K 5% 1/2W
R13	1-247-286-00	CARBON, NONFLAMABLE 82K 5% 1/2W (S/N. 11231 and higher (PAL)) (S/N. 10061 and higher (SECAM))

△ RY1	1-515-493-00	12V 75mA
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△ T1	1-421-457-00	LINE FILTER
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Ref. No.	Parts No.	Description
PW-79 BOARD ----- (S/N. Up to 10600 (PAL)) (S/N. Up to 10050 (SECAM))		

△ 1-413-071-22	SWITCHING REGULATOR (WITH PW-79, FU-16)
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△ 1-533-037-XX	HOLDER, FUSE
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1-605-936-00	PRINTED CIRCUIT BOARD "FU-16"
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C1	9-982-833-01	MYLAR 0.22 630V
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△ C2	1-161-734-00	CERAMIC 0.0022 20% 400V
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△ C3	1-161-734-00	CERAMIC 0.0022 20% 400V
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C4	9-982-837-01	ELECT 22 400V
C5	1-130-141-00	MYLAR 0.01 20% 30V

C6	9-982-832-01	CERAMIC 0.001 500V
C7	9-982-835-01	MYLAR 0.47 50V
C8	1-108-579-00	MYLAR 0.01 5% 50V
C10	1-108-571-00	MYLAR 0.047 5% 50V
C11	9-982-836-01	MYLAR 0.068 50V

C13	9-982-840-01	ELECT 47 350V
C14	1-130-356-00	MYLAR 0.47 10% 250V
C15	1-130-356-00	MYLAR 0.47 10% 250V
C25	9-982-844-01	ELECT 10 250V
C26	9-982-844-01	ELECT 10 250V

C27	9-982-844-01	ELECT 10 250V
C28	9-982-844-01	ELECT 10 250V
C29	9-982-844-01	ELECT 10 250V
C30	9-982-844-01	ELECT 10 250V
C31	9-982-834-01	MYLAR 2.2 250V

△ C32	1-161-734-00	CERAMIC 0.0022 20% 400V
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△ C33	1-161-734-00	CERAMIC 0.0022 20% 400V
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C34	9-982-834-01	MYLAR 2.2 250V
C36	1-108-579-00	MYLAR 0.01 5% 50V

D1	8-719-303-41	S-34
D2	8-719-815-80	1S1587
D3	8-719-815-80	1S1587
D4	8-719-815-80	1S1587
D5	8-719-815-80	1S1587
D6	8-719-815-80	1S1587



Ref. No.	Parts No.	Description
D7	8-719-815-80	1S1587
D8	8-719-912-52	ESAC25-02C
D9	8-719-912-52	ESAC25-02C
D10	8-719-912-50	ESAC25-02N
D11	8-719-912-52	ESAC25-02C
D12	8-719-924-06	ERC24-06S
D13	8-719-924-06	ERC24-06S
D14	8-719-156-25	RD5.6E-B2Z
D15	8-719-151-07	RD5.1E-B
D16	9-982-876-01	SCR, SF5G41
F1	9-982-878-01	THERMAL, 2A 120V 147degrees

IC1	8-759-729-03	NJM2903D (JRC)
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 L1	1-421-349-00	FILTER, LINE
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L2	1-421-329-00	10
L4	1-421-348-00	6.5mH
L5	9-982-877-01	20
L6	9-982-877-01	20
L7	9-982-877-01	20
L8	9-982-877-01	20
L9	9-982-877-01	20
L10	9-982-877-01	20
L11	1-421-329-00	10
L12	1-421-329-00	10
L13	1-421-329-00	10
L14	1-421-329-00	10
L15	1-421-329-00	10

Q1	8-729-950-40	ETD55-040B
Q2	8-729-950-40	ETD55-040B
Q3	8-763-623-00	2SC1810
Q4	8-765-141-00	2SA911
Q5	8-763-623-00	2SC1810
Q6	8-729-612-77	2SA1027R
Q7	8-729-612-77	2SA1027R
Q8	8-729-612-77	2SA1027R
Q9	8-729-663-47	2SC1364
Q10	8-729-965-61	2SC2656

Ref. No.	Parts No.	Description
Q11	8-729-663-47	2SC1364
Q12	8-729-965-61	2SC2656

R1	1-211-514-00	CARBON, NONFLAMMABLE 47 1/4W 5%
R2	1-211-520-00	CARBON, NONFLAMMABLE 82 1/4W 5%
R3	1-211-518-00	CARBON, NONFLAMMABLE 68 1/4W 5%
R4	1-211-528-00	CARBON, NONFLAMMABLE 180 1/4W 5%
R5	1-206-698-00	METAL 27K 2W 5%
R6	1-206-698-00	METAL 27K 2W 5%
R7	1-206-698-00	METAL 27K 2W 5%
R8	1-206-698-00	METAL 27K 2W 5%
R9	1-214-595-00	METAL 100K 1W 5%
R10	1-214-597-00	METAL 100K 2W 5%
R11	1-214-998-00	METAL 100K 1W 5%
R12	1-211-553-00	CARBON, NONFLAMMABLE 2.7K 1/4W 5%
R14	1-211-526-00	CARBON, NONFLAMMABLE 150 1/4W 5%
R16	1-211-528-00	CARBON, NONFLAMMABLE 180 1/4W 5%
R18	1-211-553-00	CARBON, NONFLAMMABLE 2.7K 1/4W 5%
R24	1-211-520-00	CARBON, NONFLAMMABLE 82 1/4W

 R25	1-217-160-00	CEMENT 1 5W
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R26	9-982-828-01	METAL 68 1W
R27	9-982-830-01	PC 100 3W
R29	1-214-595-00	METAL 100K 1W 5%
R30	1-214-595-00	METAL 100K 1W 5%
R31	9-982-829-01	METAL 0.68 1W 5%
R32	9-982-829-01	METAL 0.68 1W 5%
R37	1-244-869-00	CARBON 680 1/2W 5%

RV1	9-982-831-01	METAL, VAR 1K 1/2W
RV2	9-982-831-01	METAL, VAR 1K 1/2W

T1	1-543-100-00	DRIVE
T2	1-543-100-00	DRIVE

 T3	1-446-982-00	CONVERTER
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Ref. No.	Parts No.	Description
R6	9-983-524-01	METAL 27K 3W 5%
R7	9-983-524-01	METAL 27K 3W 5%
R8	9-983-524-01	METAL 27K 3W 5%
R9	9-983-525-01	METAL 100K 2W 5%
R10	9-983-526-01	METAL 100K 3W 5%
R11	1-214-998-00	METAL 100K 1W 5%
R12	1-247-140-00	CARBON, NONFLAMMABLE 2400 1/4W 5%
R13	1-247-131-00	CARBON, NONFLAMMABLE 1K 1/4W 5%
R14	1-247-113-00	CARBON, NONFLAMMABLE 180 1/4W 5%
R16	1-247-113-00	CARBON, NONFLAMMABLE 180 1/4W 5%
R18	1-247-141-00	CARBON, NONFLAMMABLE 2.7K 1/4W 5%
R19	1-247-127-00	CARBON, NONFLAMMABLE 680 1/4W 5%
R24	1-247-127-00	CARBON, NONFLAMMABLE 680 1/4W 5%

**A** R25 1-217-160-00 CEMENT 1 5W

R26 9-983-527-01 METAL 68 1W

R27 9-982-830-01 PC 100 3W

R29 9-983-525-01 METAL 100K 2W 5%

R30 9-983-525-01 METAL 100K 2W 5%

R31 9-982-829-01 METAL 0.68 1W 5%

R32 9-982-829-01 METAL 0.68 1W 5%

R37 1-247-236-00 CARBON 680 1/2W 5%

R39 9-983-528-01 METAL 4700K 1/4W

R40 1-213-151-00 METAL 6800 2W

R41 1-213-151-00 METAL 6800 2W

R42 1-213-151-00 METAL 6800 2W

R43 1-213-151-00 METAL 6800 2W

**A** R44 1-217-158-00 METAL 0.47 5W

RV1 9-982-831-01 METAL, VAR 1K 1/2W

RV2 9-982-831-01 METAL, VAR 1K 1/2W

SCR1 8-719-801-42 SCR, SFOR1G42

SCR2 9-983-536-01 SCR, CR6AM

T1 1-437-148-00 DRIVE

T2 1-543-100-00 DRIVE

**A** T3 1-447-708-00 CONVERTER

T4 9-983-538-01 STEP-UP

ZD1 8-719-151-07 RD5.1EB

ZD2 8-719-151-07 RD5.1EB

Ref. No. Parts No. Description

RE-3 BOARD

A-6725-227-A MOUNTED CIRCUIT BOARD,  
RE-3 (S/N. Up to 10040; PAL)  
A-6725-227-B MOUNTED CIRCUIT BOARD,  
RE-3/S/N. 10041 and higher (PAL)  
(S/N. 10001 and higher (SECAM))

D7 8-719-200-02 10E-2

D8 8-719-200-02 10E-2

IC1 8-759-308-07 HA1807 (HITACHI)

(S/N. 10001 ~ 10040: PAL)

IC1 8-759-729-03 NJM2903D (JRC)

(S/N. 10041 and higher (PAL))

(S/N. 10001 and higher (SECAM))

IC2 8-759-729-03 NJM2903D (JRC)

(S/N. 10041 and higher (PAL))

(S/N. 10001 and higher (SECAM))

R3 1-212-526-00 METAL 510 1% 1/2W

R4 1-212-533-00 METAL 1K 1% 1/2W

R13 1-217-156-00 METAL 0.22 10% 5W

R15 1-217-156-00 METAL 0.22 10% 5W

RV1 1-224-253-XX VAR, METAL 22K  
(S/N. Up to 10040: PAL)

RV2 1-224-247-XX VAR, METAL 100  
(S/N. 10041 and higher (PAL))  
(S/N. 10001 and higher (SECAM))

RV3 1-224-247-XX VAR, METAL 100  
(S/N. 10041 and higher (PAL))  
(S/N. 10001 and higher (SECAM))

RL-14 BOARD ----- (S/N. Up to 10600 (PAL))  
(S/N. Up to 10050 (SECAM))

1-606-043-00 PRINTED CIRCUIT BOARD,  
RL-14

**A** PH1 1-519-244-00 NEON PHOTO COUPLER

Q2 8-729-177-43 2SD774

RM-4 BOARD

1-604-370-00 PRINTED CIRCUIT BOARD,  
RM-4

CN101 1-561-028-00 36P "REMOTE 2"

CN102 1-563-890-11 9P "REMOTE 1"

CN103 1-564-466-11 34P



# RP-10-1

Ref. No.	Parts No.	Description
<b>RP-10-1 BOARD</b>		
	A-6711-367-A	MOUNTED CIRCUIT BOARD, RP-10-1
D1	8-719-815-59	1S1555-S
D2	8-719-127-07	RD2.7E-B
IC1	8-743-731-00	BX-373A (SONY)
IC2	8-759-240-09	TC4009UBP (CD4009UBE; RCA)
IC3	8-743-500-00	BX-350 (SONY)
IC4	8-743-500-00	BX-350 (SONY)
IC5	8-751-300-00	CX-130 (SONY)
IC6	8-751-300-00	CX-130 (SONY)
IC7	8-729-677-14	2SC2771 (MITSUBISHI)
IC8	8-729-677-14	2SC2771 (MITSUBISHI)
IC101	8-759-240-13	TC4013BP (CD4013BE; RCA)
Q3	8-729-201-04	2SC2878
Q6	8-729-201-04	2SC2878
Q7	8-724-375-01	2SC403C
Q8	8-724-375-01	2SC403C
Q9	8-724-375-01	2SC403C
Q10	8-724-375-01	2SC403C
Q51	8-729-612-77	2SA1027R
Q52	8-729-612-77	2SA1027R
Q101	8-724-375-01	2SC403C
Q102	8-724-375-01	2SC403C
Q103	8-724-375-01	2SC403C
Q104	8-724-375-01	2SC403C
Q105	8-724-375-01	2SC403C
Q106	8-729-177-32	2SD773
Q107	8-729-113-32	2SB733
Q108	8-724-375-01	2SC403C
Q109	8-724-375-01	2SC403C
Q110	8-729-177-32	2SD773
Q111	8-729-113-32	2SB733

Ref. No.	Parts No.	Description
R29	1-244-850-00	CARBON 110 1/2W 5%
R38	1-244-850-00	CARBON 110 1/2W 5%
RV1	1-224-249-XX	VAR, METAL 1K
RV2	1-224-248-XX	VAR, METAL 470
RV3	1-224-251-XX	VAR, METAL 4.7K
RV4	1-224-250-XX	VAR, METAL 2.2K
RV5	1-224-251-XX	VAR, METAL 4.7K
RV6	1-224-250-XX	VAR, METAL 2.2K
RV7	1-224-249-XX	VAR, METAL 1K
RV8	1-224-249-XX	VAR, METAL 1K
RV9	1-224-248-XX	VAR, METAL 470
RV10	1-224-248-XX	VAR, METAL 470
RV101	1-224-249-XX	VAR, METAL 1K
RV102	1-224-249-XX	VAR, METAL 1K
T1	1-426-017-00	AF
T2	1-426-066-00	RF
T3	1-426-018-00	AF
T4	1-426-066-00	RF
T5	1-426-018-00	AF
T101	1-425-384-00	TL
T102	1-425-384-00	TL

E. PARTS



Ref. No.	Parts No.	Description
<b>RS-3-1, RS-3-2 BOARD</b>		
	A-6715-148-A	MOUNTED CIRCUIT BOARD, RS-3-1 (WITH RS-4) S/N. Up to 10600 (PAL) S/N. Up to 10050 (SECAM)
	A-6715-217-B	MOUNTED CIRCUIT BOARD, RS-3-2 (WITH RS-4) S/N. 10601 and higher (PAL) S/N. 10051 and higher (SECAM)
	1-555-697-00	WIRE ASS'Y, FLAT 50P (25mm)
	1-564-392-00	HEADER, 50P (ON THE RS-4)
C6	1-102-110-00	CERAMIC 220PF 10% 50V
C13	1-102-106-00	CERAMIC 100PF 10% 50V
C15	1-102-106-00	CERAMIC 100PF 10% 50V
C22	1-102-110-00	CERAMIC 220PF 10% 50V
C29	1-102-106-00	CERAMIC 100PF 10% 50V
C31	1-102-106-00	CERAMIC 100PF 10% 50V
C33	1-102-114-00	CERAMIC 470PF 10% 50V
C39	1-102-106-00	CERAMIC 100PF 10% 50V
C40	1-102-106-00	CERAMIC 100PF 10% 50V
C42	1-102-106-00	CERAMIC 100PF 10% 50V
C44	1-102-106-00	CERAMIC 100PF 10% 50V
C46	1-102-114-00	CERAMIC 470PF 10% 50V
C49	1-123-612-00	ELECT 2.2 50V
C50	1-102-106-00	CERAMIC 100PF 10% 50V
C52	1-102-106-00	CERAMIC 100PF 10% 50V
C53	1-102-106-00	CERAMIC 100PF 10% 50V
C54	1-102-106-00	CERAMIC 100PF 10% 50V
C56	1-102-106-00	CERAMIC 100PF 10% 50V
C57	1-102-106-00	CERAMIC 100PF 10% 50V
C101	1-102-114-00	CERAMIC 470PF 10% 50V
C502	1-102-106-00	CERAMIC 100PF 10% 50V
C503	1-102-106-00	CERAMIC 100PF 10% 50V
C504	1-102-106-00	CERAMIC 100PF 10% 50V
C506	1-102-106-00	CERAMIC 100PF 10% 50V
C510	1-102-106-00	CERAMIC 100PF 10% 50V
C511	1-102-106-00	CERAMIC 100PF 10% 50V
C512	1-102-106-00	CERAMIC 100PF 10% 50V
C514	1-102-106-00	CERAMIC 100PF 10% 50V
C517	1-102-106-00	CERAMIC 100PF 10% 50V
C519	1-102-106-00	CERAMIC 100PF 10% 50V
C521	1-102-106-00	CERAMIC 100PF 10% 50V
C523	1-102-106-00	CERAMIC 100PF 10% 50V
C531	1-102-106-00	CERAMIC 100PF 10% 50V
C534	1-102-106-00	CERAMIC 100PF 10% 50V
C542	1-102-106-00	CERAMIC 100PF 10% 50V
C545	1-102-106-00	CERAMIC 100PF 10% 50V
C598	1-102-114-00	CERAMIC 470PF 10% 50V

Ref. No.	Parts No.	Description
D1	8-719-151-07	RD5.1E-B
D5	8-719-151-07	RD5.1E-B
D29	8-719-191-07	RD9.1E-B
D37	8-719-175-07	RD7.5E-B
D42	8-719-151-07	RD5.1E-B
D505	8-719-104-10	1SS99
D507	8-719-104-10	1SS99
IC1	8-759-729-03	NJM2903D (JRC)
IC2	8-759-729-03	NJM2903D (JRC)
IC3	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC4	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC5	8-759-240-13	TC4013BP (CD4013BE; RCA)
IC6	8-759-240-30	TC4030BP (CD4030BE; RCA)
IC7	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC8	8-759-618-41	M51841P (NE555N; SIGNETICS)
IC9	8-759-618-41	M51841P (NE555N; SIGNETICS)
IC10	8-759-045-38	MC14538BCP (MOTOROLA)
IC11	8-759-132-40	μPC324C (LM324; NSC)
IC12	8-759-618-41	M51841P (NE555N; SIGNETICS)
IC13	8-759-132-40	μPC324C (LM324; NSC)
IC14	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC15	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC16	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC17	8-759-132-40	μPC324C (LM324; NSC)
IC18	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC19	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC20	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC21	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC22	8-759-240-66	TC4066BP (CD4066BE; RCA)
IC23	8-759-645-17	M54517P (MITSUBISHI)
IC24	8-759-241-61	TC40161BP (CD40161BE; RCA)
IC25	8-759-240-99	TC4099BP (CD4099BE; RCA)
IC26	8-759-240-99	TC4099BP (CD4099BE; RCA)
IC27	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC28	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC29	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC30	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC31	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC32	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC33	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC34	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC35	8-759-240-69	TC4069UBP (CD4069UBE; RCA)



# RS-3-1, 2 (RS-4)

## E. PARTS

Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
IC36	8-759-240-11	TC4011BP (CD4011BE; RCA)	IC540	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC37	8-759-240-01	TC4001BP (CD4001BE; RCA)	IC541	8-759-132-40	$\mu$ PC324C (LM324; NSC)
IC38	8-759-240-11	TC4011BP (CD4011BE; RCA)	IC542	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC39	8-759-240-01	TC4001BP (CD4001BE; RCA)	IC543	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC40	8-759-240-01	TC4001BP (CD4001BE; RCA)	IC544	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC41	8-759-250-67	TC5067BP (TOSHIBA)	IC545	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC42	8-759-645-19	M54519P (MITSUBISHI)	IC546	8-759-240-78	TC4078BP (CD4078BE; RCA)
IC43	8-759-250-67	TC5067BP (TOSHIBA)			
IC44	8-759-645-19	M54519P (MITSUBISHI)			
IC45	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q1	8-729-201-04	2SC2878
IC46	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q5	8-729-201-04	2SC2878
IC47	8-759-145-58	$\mu$ PC4558C (RC4558; RAYTHEON)	Q6	8-729-201-04	2SC2878
IC48	8-759-240-01	TC4001BP (CD4001BE; RCA)	Q7	8-729-201-04	2SC2878
IC49	8-759-240-11	TC4011BP (CD4011BE; RCA)	Q8	8-729-201-04	2SC2878
IC50	8-759-240-01	TC4001BP (CD4001BE; RCA)	Q9	8-729-201-04	2SC2878
IC51	8-759-045-38	MC14538BCP (MOTOROLA)	Q11	8-729-201-04	2SC2878
IC501	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q12	8-729-201-04	2SC2878
IC502	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q13	8-729-201-04	2SC2878
IC503	8-759-245-16	TC4516BP (MC14516BCP; MOT)	Q14	8-729-201-04	2SC2878
IC504	8-759-245-16	TC4516BP (MC14516BCP; MOT)	Q15	8-729-201-04	2SC2878
IC505	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q16	8-729-201-04	2SC2878
IC506	8-759-132-40	$\mu$ PC324C (LM324; NSC)	Q18	8-729-201-04	2SC2878
IC507	8-759-245-16	TC4516BP (MC14516BCP; MOT)	Q19	8-729-201-04	2SC2878
IC508	8-759-245-16	TC4516BP (MC14516BCP; MOT)	Q501	8-729-201-04	2SC2878
IC509	8-759-240-11	TC4011BP (CD4011BE; RCA)	Q502	8-729-201-04	2SC2878
IC510	8-759-240-11	TC4011BP (CD4011BE; RCA)	Q503	8-729-201-04	2SC2878
IC511	8-759-240-01	TC4001BP (CD4001BE; RCA)	Q504	8-729-201-04	2SC2878
IC512	8-759-240-69	TC4069UBP (CD4069UBE; RCA)			
IC513	8-759-240-66	TC4066BP (CD4066BE; RCA)	R69	1-212-714-00	METAL 330K 1% 1/2W
IC514	8-759-240-66	TC4066BP (CD4066BE; RCA)	R87	1-214-961-00	METAL 750K 1% 1/2W
IC515	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R90	1-214-961-00	METAL 750K 1% 1/2W
IC516	8-759-240-66	TC4066BP (CD4066BE; RCA)	R222	1-212-526-00	METAL 510 1% 1/2W
IC517	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R223	1-212-526-00	METAL 510 1% 1/2W
IC518	8-759-240-69	TC4069UBP (CD4069UBE; RCA)			
IC519	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R513	1-212-708-00	METAL 180K 1% 1/2W
IC520	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R514	1-212-708-00	METAL 180K 1% 1/2W
IC521	8-759-240-66	TC4066BP (CD4066BE; RCA)	R551	1-212-708-00	METAL 180K 1% 1/2W
IC522	8-759-240-66	TC4066BP (CD4066BE; RCA)	R552	1-212-708-00	METAL 180K 1% 1/2W
IC523	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R589	1-212-707-00	METAL 150K 1% 1/2W
IC524	8-759-240-66	TC4066BP (CD4066BE; RCA)			
IC525	8-759-240-66	TC4066BP (CD4066BE; RCA)	R605	1-212-707-00	METAL 150K 1% 1/2W
IC526	8-759-240-01	TC4001BP (CD4001BE; RCA)	R620	1-212-714-00	METAL 330K 1% 1/2W
IC527	8-759-240-11	TC4011BP (CD4011BE; RCA)	R622	1-212-715-00	METAL 360K 1% 1/2W
IC528	8-759-045-38	MC14538BCP (MOTOROLA)	R624	1-212-712-00	METAL 270K 1% 1/2W
IC529	8-759-132-40	$\mu$ PC324C (LM324; NSC)	R636	1-214-961-00	METAL 750K 1% 1/2W
IC530	8-759-240-01	TC4001BP (CD4001BE; RCA)			
IC531	8-759-240-66	TC4066BP (CD4066BE; RCA)	R653	1-212-712-00	METAL 270K 1% 1/2W
IC532	8-759-240-66	TC4066BP (CD4066BE; RCA)	R665	1-214-961-00	METAL 750K 1% 1/2W
IC533	8-759-240-11	TC4011BP (CD4011BE; RCA)			
IC534	8-759-045-38	MC14538BCP (MOTOROLA)	RV1	1-224-253-XX	VAR, METAL 22K
IC535	8-759-240-01	TC4001BP (CD4001BE; RCA)	RV2	1-224-253-XX	VAR, METAL 22K
IC536	8-759-045-38	MC14538BCP (MOTOROLA)	RV501	1-224-251-XX	VAR, METAL 4.7K
IC537	8-759-240-01	TC4001BP (CD4001BE; RCA)	RV502	1-224-252-XX	VAR, METAL 10K
IC538	8-759-240-01	TC4001BP (CD4001BE; RCA)	RV503	1-224-251-XX	VAR, METAL 4.7K
IC539	8-759-240-01	TC4001BP (CD4001BE; RCA)	RV504	1-224-252-XX	VAR, METAL 10K




# SA-9, SR-17, SV-52-1 (CF-9)

Ref. No.	Parts No.	Description
<b>SA-9 BOARD</b>		
	1-604-377-00	PRINTED CIRCUIT BOARD, SA-9

S1	1-516-783-XX	SLIDE "LEVEL (A2)"
S2	1-516-777-XX	SLIDE "600 OHM (A2)"
S3	1-516-783-XX	SLIDE "LEVEL (A1)"
S4	1-516-777-XX	SLIDE "600 OHM (A1)"
S5	1-516-777-XX	SLIDE "FRAMING SERVO"
S6	1-516-777-XX	SLIDE "SERVO LOCK"
S7	1-516-777-XX	SLIDE "75 OHM (V)"

<b>SR-17 BOARD</b>		
	1-605-755-00	PRINTED CIRCUIT BOARD, SR-17

## SV-52-1 BOARD

	 A-6715-164-C	MOUNTED CIRCUIT BOARD, SV-52-1 (WITH CF-9)
	1-555-697-00	WIRE ASS'Y, FLAT 50P (25mm)
	1-564-392-00	HEADER, 50P (ON THE CF-9)
C31	1-161-342-00	CERAMIC 43PF SL 5% 50V
C35	1-130-224-00	POLYPROPYLENE 0.015 5% 50V
C39	1-102-114-00	CERAMIC 470PF B 10% 50V
C73	1-102-114-00	CERAMIC 470PF B 10% 50V
C103	1-161-267-00	CERAMIC 47PF SL 5% 50V

Ref. No.	Parts No.	Description
C104	1-161-267-00	CERAMIC 47PF SL 5% 50V
C108	1-102-106-00	CERAMIC 100PF B 10% 50V
C501	1-102-114-00	CERAMIC 470PF B 10% 50V
C502	1-102-110-00	CERAMIC 220PF B 10% 50V
C503	1-102-110-00	CERAMIC 220PF B 10% 50V
C504	1-102-114-00	CERAMIC 470PF B 10% 50V
C505	1-102-114-00	CERAMIC 470PF B 10% 50V
C506	1-102-114-00	CERAMIC 470PF B 10% 50V
C507	1-102-114-00	CERAMIC 470PF B 10% 50V
C508	1-102-114-00	CERAMIC 470PF B 10% 50V
C509	1-102-114-00	CERAMIC 470PF B 10% 50V
C510	1-102-114-00	CERAMIC 470PF B 10% 50V
C511	1-102-114-00	CERAMIC 470PF B 10% 50V
C512	1-102-114-00	CERAMIC 470PF B 10% 50V
C515	1-102-114-00	CERAMIC 470PF B 10% 50V
C516	1-102-114-00	CERAMIC 470PF B 10% 50V
C518	1-102-114-00	CERAMIC 470PF B 10% 50V
C522	1-102-114-00	CERAMIC 470PF B 10% 50V
C523	1-102-114-00	CERAMIC 470PF B 10% 50V
C702	1-102-114-00	CERAMIC 470PF B 10% 50V
C709	1-102-110-00	CERAMIC 220PF B 10% 50V
C716	1-102-114-00	CERAMIC 470PF B 10% 50V
C720	1-102-114-00	CERAMIC 470PF B 10% 50V
C721	1-102-114-00	CERAMIC 470PF B 10% 50V
C722	1-102-114-00	CERAMIC 470PF B 10% 50V
CP1	1-527-832-00	OSC 4.43 MHz
D10	8-719-151-07	RD5.1E-B
D15	8-719-815-25	1S1925-P
D16	8-719-815-25	1S1925-P
IC1	8-759-145-58	μPC4558C (RC4558; RAYTHEON)
IC2	8-759-729-03	NJM2903D (JRC)
IC3	8-759-145-58	μPC4558C (RC4558; RAYTHEON)
IC4	8-759-132-40	μPC324C (LM324; NSC)
IC5	8-751-941-04	CX-194B-4 (SONY)
IC6	8-759-132-40	μPC324C (LM324; NSC)
IC7	8-759-131-11	μPC311C (NEC)
IC8	8-759-132-40	μPC324C (LM324; NSC)
IC9	8-759-131-11	μPC311C (NEC)
IC10	8-759-645-17	M54517P (MITSUBISHI)
IC11	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC12	8-759-045-38	MC14538BCP (MOTOROLA)
IC13	8-759-145-58	μPC4558C (RC4558; RAYTHEON)
IC14	8-759-240-99	TC4099BP (CD4099BE; RCA)
IC15	8-759-241-61	TC40161BP (CD40161BE; RCA)



## E. PARTS

BVU-820P/S



Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
RV1	1-224-255-XX	VAR, METAL 100K	IC1	8-759-241-61	TC40161BP (CD40161BE; RCA)
RV2	1-224-255-XX	VAR, METAL 100K	IC2	8-759-245-12	TC4512BP (MC14512BCP; MOT)
RV3	1-224-252-XX	VAR, METAL 10K	IC3	8-759-240-81	TC4081BP (CD4081BE; RCA)
RV4	1-224-254-XX	VAR, METAL 47K	IC4	8-759-240-11	TC4011BP (CD4011BE; RCA)
RV5	1-224-255-XX	VAR, METAL 100K	IC5	8-759-240-73	TC4073BP (CD4073BE; RCA)
		(S/N. Up to 10220: P/10020: S)			
RV5	1-226-775-00	VAR, METAL 100K	IC6	8-759-240-75	TC4075BP (CD4075BE; RCA)
		(S/N. 10221 (P)/10021 (S) and higher)	IC7	8-759-240-81	TC4081BP (CD4081BE; RCA)
RV6	1-224-256-XX	VAR, METAL 220K	IC8	8-759-245-12	TC4512BP (MC14512BCP; MOT)
RV7	1-224-256-XX	VAR, METAL 220K	IC9	8-759-240-81	TC4081BP (CD4081BE; RCA)
		(S/N. Up to 10220: P/10020: S)	IC10	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
RV7	1-226-776-00	VAR, METAL 220K			
		(S/N. 10221 (P)/10021 (S) and higher)	IC11	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
RV8	1-224-256-XX	VAR, METAL 220K	IC12	8-759-240-82	TC4082BP (CD4082BE; RCA)
RV9	1-224-255-XX	VAR, METAL 100K	IC13	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
RV10	1-224-253-XX	VAR, METAL 22K	IC14	8-759-240-71	TC4071BP (CD4071BE; RCA)
			IC15	8-759-240-01	TC4001BP (CD4001BE; RCA)
RV11	1-224-252-XX	VAR, METAL 10K			
RV12	1-224-251-XX	VAR, METAL 4.7K	IC16	8-759-240-43	TC4043BP (CD4043BE; RCA)
RV13	1-224-249-XX	VAR, METAL 1K	IC17	8-759-240-71	TC4071BP (CD4071BE; RCA)
RV14	1-224-254-XX	VAR, METAL 47K	IC18	8-759-240-71	TC4071BP (CD4071BE; RCA)
RV15	1-224-252-XX	VAR, METAL 10K	IC19	8-759-240-73	TC4073BP (CD4073BE; RCA)
			IC20	8-759-645-29	M54529P (MITSUBISHI)
RV16	1-224-248-XX	VAR, METAL 470			
RV17	1-224-254-XX	VAR, METAL 47K	IC21	8-759-240-25	TC4025BP (CD4025BE; RCA)
RV100	1-226-774-00	VAR, METAL 47K	IC22	8-759-240-75	TC4075BP (CD4075BE; RCA)
		(S/N. 10301 (P)/10051 (S) and higher)	IC23	8-759-240-01	TC4001BP (CD4001BE; RCA)
RV401	1-226-777-00	VAR, METAL 1M	IC24	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
		(S/N. 10221 (P)/10021 (S) and higher)	IC25	8-759-240-25	TC4025BP (CD4025BE; RCA)
RV402	1-226-776-00	VAR, METAL 220K			
		(S/N. 10221 to 10300: P/10021 to 10050: S)	IC26	8-759-240-43	TC4043BP (CD4043BE; RCA)
RV402	1-226-777-00	VAR, METAL 1M	IC27	8-759-645-29	M54529P (MITSUBISHI)
		(S/N. 10301 (P)/10051 (S) and higher)	IC28	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
RV501	1-224-256-XX	VAR, METAL 220K	IC29	8-759-240-23	TC4023BP (CD4023BE; RCA)
RV502	1-224-256-XX	VAR, METAL 220K	IC30	8-759-045-84	MC14584BCP (MOTOROLA)
		(S/N. Up to 10600: P/10050: S)			
			IC31	8-759-240-81	TC4081BP (CD4081BE; RCA)
			IC32	8-759-240-11	TC4011BP (CD4011BE; RCA)
			IC33	8-759-240-01	TC4001BP (CD4001BE; RCA)
			IC34	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
			IC35	8-759-240-75	TC4075BP (CD4075BE; RCA)
			IC36	8-759-240-71	TC4071BP (CD4071BE; RCA)
			IC37	8-759-240-12	TC4012BP (CD4012BE; RCA)
			IC38	8-759-240-71	TC4071BP (CD4071BE; RCA)
			IC39	8-759-240-72	TC4072BP (CD4072BE; RCA)
			IC40	8-759-240-73	TC4073BP (CD4073BE; RCA)
			IC41	8-759-245-28	TC4528BP (MC14528BCP; MOT)
			IC42	8-759-240-81	TC4081BP (CD4081BE; RCA)
			IC43	8-759-240-11	TC4011BP (CD4011BE; RCA)
			IC44	8-759-645-29	M54529P (MITSUBISHI)
			IC45	8-759-240-73	TC4073BP (CD4073BE; RCA)
			IC46	8-759-240-71	TC4071BP (CD4071BE; RCA)
			IC47	8-759-240-01	TC4001BP (CD4001BE; RCA)
			IC48	8-759-240-01	TC4001BP (CD4001BE; RCA)
			IC49	8-759-240-11	TC4011BP (CD4011BE; RCA)
			IC50	8-759-345-38	HD14538BP (HITACHI)
<b>SY-36-1 BOARD</b>					
	A-6717-292-B	MOUNTED CIRCUIT BOARD, SY-36-1			
C112	1-102-114-00	CERAMIC 470P 10% 50V			
C116	1-102-114-00	CERAMIC 470P 10% 50V			
C117	1-102-114-00	CERAMIC 470P 10% 50V			



# SY-36-1, SY-37-1

E. PARTS

Ref. No.	Parts No.	Description
IC51	8-759-240-68	TC4068BP (CD4068BE; RCA)
IC52	8-759-240-23	TC4023BP (CD4023BE; RCA)
IC53	8-759-240-43	TC4043BP (CD4023BE; RCA)
IC54	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC55	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC56	8-759-645-29	M54529P (MITSUBISHI)
IC57	8-759-240-93	TC4093BP (CD4093BE; RCA)
IC58	8-759-240-73	TC4073BP (CD4073BE; RCA)
IC59	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC60	8-759-645-29	M54529P (MITSUBISHI)
IC61	8-759-045-84	MC14584BCP (MOTOROLA)
IC62	8-759-645-29	M54529P (MITSUBISHI)
IC63	8-759-240-27	TC4027BP (CD4027BE; RCA)
IC64	8-759-240-71	TC4071BP (CD4071BE; RCA)
IC65	8-759-240-82	TC4082BP (CD4082BE; RCA)
IC66	8-757-561-00	CX-756A (SONY)
IC67	8-757-570-00	CX-757 (SONY)
IC68	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC69	8-759-240-71	TC4071BP (CD4071BE; RCA)
IC70	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC71	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC72	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC73	8-759-240-69	TC4069UBP (CD4069UBE; RCA)
IC74	8-759-240-75	TC4075BP (CD4075BE; RCA)
Q1	8-729-201-04	2SC2878
RV1	1-226-096-00	VAR, METAL 500K
RV2	1-224-940-00	VAR, METAL 10K
RV3	1-226-096-00	VAR, METAL 500K

SY-37-1 BOARD \*: IC3, 6, 7, 72 = Not handling at RPC.

A-6717-233-A MOUNTED CIRCUIT BOARD,  
SY-37-1

C2	1-102-108-00	CERAMIC 150PF 10% 50V
C4	1-131-377-00	TANTALUM 10 20% 10V
C5	1-102-963-00	CERAMIC 33PF 5% 50V
C6	1-102-963-00	CERAMIC 33PF 5% 50V

Ref. No.	Parts No.	Description
CN31	1-560-454-31	40P
CN32	1-560-454-31	40P
D1	8-719-168-88	RD6.8F-B
D2	8-719-709-25	1S1925-P
D10	8-719-815-59	1S1555S
IC1	8-759-995-14	AM9513DC (AMD)
IC2	8-759-906-80	LH0080 (SHARP)
IC3	* 8-759-762-28	MBM2732U8201-4 (FUJITSU)
IC4	8-759-906-84	LH0084 (SHARP)
IC5	8-719-815-59	AM9519APC (AMD)
IC6	* 8-759-762-30	MBM2732U8203-4 (FUJITSU)
IC7	* 8-759-762-29	MBM2732U8202-4 (FUJITSU)
IC8	8-759-921-28	MSM2128-1AS (OKI)
IC9	8-759-926-31	AM26LS31PC (AMD)
IC10	8-759-926-32	AM26LS32PC (AMD)
IC11	8-759-902-44	SN74LS244N (TI)
IC12	8-759-901-39	SN74LS139N (TI)
IC14	8-759-045-98	MC14598BCP (MOTOROLA)
IC15	8-759-974-07	SN7407N (TI)
IC16	8-759-902-44	SN74LS244N (TI)
IC17	8-759-900-74	SN74LS74AN (TI)
IC18	8-759-902-44	SN74LS244N (TI)
IC19	8-759-045-98	MC14598BCP (MOTOROLA)
IC20	8-759-903-78	SN74LS378N (TI)
IC21	8-759-903-77	SN74LS377N (TI)
IC22	8-759-801-11	LB1261 (SANYO)
IC23	8-759-801-11	LB1261 (SANYO)
IC24	8-759-045-98	MC14598BCP (MOTOROLA)
IC25	8-759-900-05	SN74LS05N (TI)
IC26	8-759-903-77	SN74LS377N (TI)
IC27	8-759-220-74	TC40H074P (TOSHIBA)
IC28	8-759-240-20	TC4020BP (CD4020BE; RCA)
IC29	8-759-902-44	SN74LS244N (TI)
IC30	8-759-045-98	MC14598BCP (MOTOROLA)
IC31	8-759-900-05	SN74LS05N (TI)
IC32	8-759-903-77	SN74LS377N (TI)
IC33	8-759-900-32	SN74LS32N (TI)
IC34	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC35	8-759-692-44	M74LS244P (MITSUBISHI)
IC36	8-759-045-98	MC14598BCP (MOTOROLA)



Ref. No.	Parts No.	Description
IC37	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC38	8-759-903-77	SN74LS377N (TI)
IC39	8-759-045-84	MC14584BCP (MOTOROLA)
IC40	8-759-902-44	SN74LS244N (TI)
IC41	8-759-045-98	MC14598BCP (MOTOROLA)
IC42	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC43	8-759-903-77	SN74LS377N (TI)
IC44	8-759-901-38	SN74LS138N (TI)
IC45	8-759-729-03	NJM2903D (JRC)
IC46	8-759-902-44	SN74LS244N (TI)
IC48	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC49	8-759-903-77	SN74LS377N (TI)
IC50	8-759-901-38	SN74LS138N (TI)
IC51	8-759-223-68	TC40H368P (TOSHIBA)
IC52	8-759-902-44	SN74LS244N (TI)
IC53	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC54	8-759-903-77	SN74LS377N (TI)
IC55	8-759-901-38	SN74LS138N (TI)
IC56	8-759-903-77	SN74LS377N (TI)
IC57	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC58	8-759-903-77	SN74LS377N (TI)
IC59	8-759-901-38	SN74LS138N (TI)
IC60	8-759-901-38	SN74LS138N (TI)
IC61	8-759-100-54	$\mu$ PA54H (NEC)
IC62	8-759-100-64	$\mu$ PA64H (NEC)
IC63	8-759-100-54	$\mu$ PA54H (NEC)
IC64	8-759-100-64	$\mu$ PA64H (NEC)
IC65	8-759-901-58	SN74LS158N (TI)
IC66	8-759-901-58	SN74LS158N (TI)
IC70	8-759-926-31	AM26LS31PC (AMD)
IC71	8-759-926-32	AM26LS32PC (AMD)
IC72	* 8-759-762-31	MBM2732U8204-4 (FUJITSU)
Q2	8-729-315-63	2SB856
Q3	8-729-663-48	2SC1364-8
S1	1-553-542-00	KEY "RESET"
S2	1-516-923-00	DIP
S3	1-553-076-00	SLIDE
S5	1-516-925-21	DIP "EIA/CCIR"
X1	1-527-827-00	4.9152MHz

Ref.No.	Parts No.	Description
SY-37A BOARD		
	A-6717-233-B	MOUNTED CIRCUIT BOARD, SY-37A
C1	1-123-309-00	ELECT 330 20% 10V
C2	1-102-108-00	CERAMIC 150PF 10% 50V
C3	1-123-332-00	ELECT 47 20% 25V
C5	1-102-963-00	CERAMIC 33PF 5% 50V
C6	1-102-963-00	CERAMIC 33PF 5% 50V
C7	1-102-074-00	CERAMIC 0.001 10% 50V
CN31	1-560-454-31	FLAT CABLE, 40P
CN32	1-560-454-31	FLAT CABLE, 40P
D1	8-719-168-88	RD6.8F-B
D2	8-719-101-97	1SS97-1
D3	8-719-911-19	1SS119
D5	8-719-911-19	1SS119
D7	8-719-911-19	1SS119
D8	8-719-911-19	1SS119
D9	8-719-911-19	1SS119
D10	8-719-911-19	1SS119
IC1	8-759-995-14	AM9513DC (TI)
IC2	8-759-960-80	LH0080 (SHARP)
IC4	8-759-906-84	LH0084 (SHARP)
IC5	8-759-995-19	AM9519APC (TI)
IC8	8-759-905-23	MSM2128-15RS (OKI)
IC9	8-759-926-31	AM26LS31PC (TI)
IC10	8-759-926-32	AM26LS32PC (TI)
IC11	8-759-902-44	SN74LS244N (TI)
IC12	8-759-901-39	SN74LS139N (TI)
IC14	8-759-045-98	MC14598BCP (MOTOROLA)
IC15	8-759-974-07	SN7407N (TI)
IC16	8-759-902-44	SN74LS244N (TI)
IC17	8-759-900-74	SN74LS74AN (TI)
IC18	8-759-902-44	SN74LS244N (TI)
IC19	8-759-045-98	MC14598BCP (MOTOROLA)
IC20	8-759-903-78	SN74LS378N (TI)
IC21	8-759-903-77	SN74LS377N (TI)
IC22	8-759-801-11	LB1261 (SANYO)
IC23	8-759-801-11	LB1261 (SANYO)
IC24	8-759-045-98	MC14598BCP (MOTOROLA)
IC25	8-759-900-05	SN74LS05N (TI)
IC26	8-759-903-77	SN74LS377N (TI)
IC27	8-759-220-74	TC40H074P (TOSHIBA)
IC28	8-759-240-20	TC4020BP (TOSHIBA)
IC29	8-759-902-44	SN74LS244N (TI)



# SY-37A, SY-71

Ref.No.	Parts No.	Description
IC30	8-759-045-98	MC14598BCP (MOTOROLA)
IC31	8-759-900-05	SN74LS05N (TI)
IC32	8-759-903-77	SN74LS377N (TI)
IC33	8-759-900-32	SN74LS32N (TI)
IC34	8-759-240-01	TC4001BP (TOSHIBA)
IC35	8-759-902-44	SN74LS244N (TI)
IC36	8-759-045-98	MC14598BCP (MOTOROLA)
IC37	8-759-245-12	TC4512BP (TOSHIBA)
IC38	8-759-903-77	SN74LS377N (TI)
IC39	8-759-045-84	MC14584BCP (MOTOROLA)
IC40	8-759-902-44	SN74LS244N (TI)
IC41	8-759-045-98	MC14598BCP (MOTOROLA)
IC42	8-759-245-12	TC4512BP (TOSHIBA)
IC43	8-759-903-77	SN74LS377N (TI)
IC44	8-759-901-38	SN74LS138N (TI)
IC45	8-759-729-03	MJM2903D (JRC)
IC46	8-759-902-44	SN74LS244N (TI)
IC48	8-759-245-12	TC4512BP (TOSHIBA)
IC49	8-759-903-77	SN74LS377N (TI)
IC50	8-759-901-38	SN74LS138N (TI)
IC51	8-759-223-68	TC40H368P (TOSHIBA)
IC52	8-759-902-44	SN74LS244N (TI)
IC53	8-759-245-12	TC4512BP (TOSHIBA)
IC54	8-759-903-77	SN74LS377N (TI)
IC55	8-759-901-38	SN74LS138N (TI)
IC56	8-759-903-77	SN74LS377N (TI)
IC57	8-759-245-12	TC4512BP (TOSHIBA)
IC58	8-759-903-77	SN74LS377N (TI)
IC59	8-759-901-38	SN74LS138N (TI)
IC61	8-759-100-54	$\mu$ PA54H (NEC)
IC62	8-759-100-64	$\mu$ PA64H (NEC)
IC63	8-759-100-54	$\mu$ PA54H (NEC)
IC64	8-759-100-64	$\mu$ PA64H (NEC)
IC65	8-759-901-58	SN74LS158N (TI)
IC66	8-759-901-58	SN74LS158N (TI)
IC70	8-759-926-31	AM26LS31PC (TI)
IC71	8-759-926-32	AM26LS32PC (TI)
IC73	8-759-916-29	SN74HC74N (TI)
IC74	8-759-901-39	SN74LS139N (TI)
IC75	8-759-770-64	27128-U820V-5IC75
L1	1-459-155-00	45 $\mu$ H
Q1	8-729-600-28	2SC634SP-8
Q2	8-729-315-63	2SB856
Q3	8-729-600-28	2SC634SP-8
Q4	8-729-600-28	2SC634SP-8

Ref. No.	Parts No.	Description
S1	1-553-542-00	SWITCH, KEY
S2	1-570-598-11	SWITCH, DIP
S3	1-553-076-21	SWITCH, SLIDE
S5	1-570-623-11	SWITCH, DIP
X1	1-527-827-00	CRYSTAL, 4.9152MHz

## SY-71 BOARD

A-6717-208-A

MOUNTED CIRCUIT BOARD,  
SY-71

C13	1-123-299-00	ELECT 1000 20% 6.3V
D8	8-719-200-02	10E-2
D9	8-719-200-02	10E-2
D10	8-719-200-02	10E-2
D13	8-719-200-02	10E-2
D14	8-719-200-02	10E-2
D15	8-719-200-02	10E-2
D18	8-719-200-02	10E-2
D19	8-719-200-02	10E-2
D20	8-719-200-02	10E-2
D23	8-719-200-02	10E-2
D24	8-719-200-02	10E-2
D25	8-719-200-02	10E-2
D29	8-719-200-02	10E-2
D31	8-719-200-02	10E-2
D33	8-719-200-02	10E-2
D34	8-719-200-02	10E-2
D35	8-719-200-02	10E-2
D38	8-719-200-02	10E-2
D40	8-719-200-02	10E-2
D42	8-719-200-02	10E-2
D43	8-719-200-02	10E-2
D44	8-719-200-02	10E-2
D47	8-719-200-02	10E-2
D48	8-719-200-02	10E-2
D49	8-719-200-02	10E-2



Ref. No.	Parts No.	Description
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D54	8-719-200-02	10E-2
D55	8-719-200-02	10E-2
D56	8-719-200-02	10E-2
D57	8-719-200-02	10E-2
D58	8-719-200-02	10E-2

IC1	8-743-430-00	BX-343 (SONY)
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Q2	8-729-103-43	2SB734
Q3	8-729-177-43	2SD774
Q6	8-729-103-43	2SB734
Q7	8-729-177-43	2SD774
Q10	8-729-177-43	2SD774

Q12	8-729-103-43	2SB734
Q13	8-729-177-43	2SD774
Q16	8-729-177-43	2SD774
Q17	8-729-103-43	2SB734
Q21	8-729-331-53	2SC2315

Q23	8-729-283-42	2SB834
Q24	8-729-331-53	2SC2315
Q26	8-729-283-42	2SB834
Q27	8-729-331-53	2SC2315
Q30	8-729-384-48	2SA844

Q32	8-729-103-43	2SB734
Q35	8-729-283-42	2SB834
Q36	8-729-331-53	2SC2315
Q40	8-729-283-42	2SB834
Q41	8-729-331-53	2SC2315

 R42	1-206-568-00	WIREWOUND 27 5% 5W
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 R43	1-206-568-00	WIREWOUND 27 5% 5W
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R57	1-244-865-00	CARBON 470 5% 1/2W
R61	1-244-865-00	CARBON 470 5% 1/2W
R70	1-244-865-00	CARBON 470 5% 1/2W

R84	1-217-020-00	CARBON 12 5% 3W
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## TC-12 BOARD

1-604-760-00	PRINTED CIRCUIT BOARD, TC-12
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Ref. No.	Parts No.	Description
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## TC-13-1 BOARD

A-6715-135-A	MOUNTED CIRCUIT BOARD, TC-13-1 (for S/N. Up to 10040)
A-6715-135-B	MOUNTED CIRCUIT BOARD, TC-13-1 (S/N. 10041 and higher: PAL S/N. 10001 and higher: SECAM)

C11	1-102-114-00	CERAMIC 470PF 10% 50V
C13	1-102-114-00	CERAMIC 470PF 10% 50V
C210	1-102-114-00	CERAMIC 470PF 10% 50V

D103	8-719-101-97	1SS97-1
D104	8-719-101-97	1SS97-1

IC1	8-759-245-10	TC4510BP (MC14510BCP; MOT)
IC2	8-759-245-10	TC4510BP (MC14510BCP; MOT)
IC3	8-759-245-10	TC4510BP (MC14510BCP; MOT)
IC4	8-759-245-10	TC4510BP (MC14510BCP; MOT)
IC5	8-759-245-10	TC4510BP (MC14510BCP; MOT)

IC6	8-759-245-10	TC4510BP (MC1451BCP; MOT)
IC7	8-759-245-10	TC4510BP (MC14510BCP; MOT)
IC8	8-759-240-23	TC4023BP (CD4023BE; RCA)
IC9	8-759-240-71	TC4071BP (CD4071BE; RCA)
IC10	8-759-240-69	TC4069UBP (CD4069UBE; RCA)

IC11	8-759-040-77	MC14077BCP (CD4077BE; RCA)
IC12	8-759-240-27	TC4027BP (CD4027BE; RCA)
IC13	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC14	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC15	8-759-245-12	TC4512BP (MC14512BCP; MOT)

IC16	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC17	8-759-240-81	TC4081BP (CD4081BE; RCA)
IC18	8-759-240-73	TC4073BP (CD4073BE; RCA)
IC19	8-759-240-71	TC4071BP (CD4071BE; RCA)
IC20	8-759-145-19	μPD4519C (MC14519BCP; MOT)

IC101	8-759-700-00	NJM4562DDR (JRC)
IC102	8-751-300-00	CX-130 (SONY)
IC103	8-765-222-20	2SC1963 (SONY)
IC104	8-759-100-22	μPA76V-FA (NEC) (S/N. 10041 (P)/10001 (S) and higher)

IC201	8-749-909-15	BX-3915A (SONY)
IC202	8-759-045-38	MC14538BCP (MOTOROLA)

IC203	8-759-245-39	TC4539BP (MC14539BCP; MOT)
IC204	8-759-245-12	TC4512BP (MC14512BCP; MOT)
IC205	8-759-240-01	TC4001BP (CD4001BE; RCA)
IC206	8-759-240-11	TC4011BP (CD4011BE; RCA)
IC207	8-759-240-85	TC4085BP (CD4085BE; RCA)



# TC-13-1, TM-4, TM-8, TM-14, WL-1, YD-14

Ref. No.	Parts No.	Description
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Q102	8-729-201-04	2SC2878
Q105	8-729-201-04	2SC2878
Q108	8-729-201-04	2SC2878
Q116	8-729-201-04	2SC2878

R153	1-244-849-00	CARBON 100 5% 1/2W
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RV101	1-224-252-XX	VAR, METAL 10K
RV102	1-224-254-XX	VAR, METAL 47K
RV103	1-224-254-XX	VAR, METAL 47K (S/N. Up to 10040)
RV103	1-224-247-XX	VAR, METAL 100 (S/N. 10041 and higher (PAL) (S/N. 10001 and higher (SECAM))

## TM-4 BOARD

1-604-367-00	PRINTED CIRCUIT BOARD, TM-4
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## TM-8 BOARD

1-604-364-00	PRINTED CIRCUIT BOARD, TM-8
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## TM-14 BOARD

1-606-977-00	PRINTED CIRCUIT BOARD, TM-14
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Ref. No.	Parts No.	Description
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## WL-1 BOARD

1-604-366-00	PRINTED CIRCUIT BOARD, WL-1
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D1	8-719-812-44	TLO124
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PL1	1-518-386-00	5V 30mA
PL2	1-518-386-00	5V 30mA

## YD-14 BOARD

A-6711-369-A	MOUNTED CIRCUIT BOARD, YD-14
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C49	1-109-690-00	DIPPED MICA 510PF 1% 500V
C95	1-109-696-00	DIPPED MICA 910PF 5% 500V
C223	1-130-201-00	PP FILM 0.068 5% 50V

CV1	1-141-240-00	TRIMMER 20PF (S/N. 10301 and higher (PAL) (S/N. 10051 and higher (SECAM))
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Ref. No.	Parts No.	Description	Ref. No.	Parts No.	Description
D3	8-719-100-27	RD4.7E-B2	Q1	8-724-375-01	2SC403C
D5	8-719-101-97	1SS97-1	Q2	8-724-375-01	2SC403C
D6	8-719-101-97	1SS97-1	Q4	8-724-375-01	2SC403C
D7	8-719-101-97	1SS97-1	Q5	8-724-375-01	2SC403C
D8	8-719-101-97	1SS97-1	Q7	8-724-375-01	2SC403C
DL1	1-415-096-31	0.3 $\mu$ S	Q8	8-724-375-01	2SC403C
DL2	1-415-154-21	35nS	Q9	8-729-384-47	2SA844-D
DL3	1-415-154-21	35nS	Q12	8-724-375-01	2SC403C
DL4	1-415-236-21	1H	Q14	8-724-375-01	2SC403C
DL5	1-415-096-31	0.3 $\mu$ S	Q15	8-724-375-01	2SC403C
FL1	1-235-010-00	HIGH PASS (S/N. Up to 10790 (PAL) (S/N. Up to 10050 (SECAM))	Q16	8-724-375-01	2SC403C
	1-235-010-21	HIGH PASS (S/N. 10791 and higher (PAL) (S/N. 10051 and higher (SECAM))	Q18	8-724-375-01	2SC403C
FL2	1-231-381-00	LOW PASS	Q19	8-724-375-01	2SC403C
FL3	1-231-380-00	LOW PASS (S/N. Up to 10790 (PAL) (S/N. Up to 10050 (SECAM))	Q20	8-724-375-01	2SC403C
	1-231-380-21	LOW PASS (S/N. 10791 and higher (PAL) (S/N. 10051 and higher (SECAM))	Q21	8-724-375-01	2SC403C
IC1	8-751-340-00	CX-134A (SONY)	Q23	8-724-375-01	2SC403C
IC2	8-751-300-00	CX-130 (SONY)	Q24	8-724-375-01	2SC403C
IC3	8-751-300-00	CX-130 (SONY)	Q25	8-724-375-01	2SC403C
IC4	8-759-270-69	TA7069P (TOSHIBA)	Q26	8-724-375-01	2SC403C
IC5	8-759-270-69	TA7069P (TOSHIBA)	Q27	8-723-305-00	2SK43-5
IC6	8-743-890-00	BX-389 (SONY)	Q28	8-729-384-47	2SA844-D
IC7	8-751-350-00	CX-135 (SONY)	Q29	8-724-375-01	2SC403C
IC8	8-759-270-76	TA7076P (TOSHIBA)	Q30	8-724-375-01	2SC403C
IC9	8-751-300-00	CX-130 (SONY)	Q31	8-729-384-47	2SA844-D
IC201	8-729-677-14	2SC2771 (MITSUBISHI)	Q32	8-761-622-00	2SC1636
IC202	8-759-345-38	HD14538BP (HITACHI)	Q33	8-729-201-04	2SC2878
IC301	8-751-300-00	CX-130 (SONY)	Q34	8-724-375-01	2SC403C
IC302	8-759-240-11	TC4011BP (CD4011BE; RCA)	Q35	8-724-375-01	2SC403C
IC303	8-743-890-00	BX-389 (SONY)	Q36	8-724-375-01	2SC403C
IC304	8-759-345-38	HD14538BP (HITACHI)	Q37	8-724-375-01	2SC403C
IC305	8-751-300-00	CX-130 (SONY)	Q39	8-724-375-01	2SC403C
L5	1-407-168-61	MICRO 82 $\mu$ H	Q201	8-724-375-01	2SC403C
L21	1-407-168-61	MICRO 82 $\mu$ H	Q202	8-729-384-47	2SA844-D
L19	1-407-166-61	MICRO 56 $\mu$ H	Q203	8-729-201-04	2SC2878
L20	1-407-167-61	MICRO 68 $\mu$ H	Q204	8-729-384-47	2SA844-D
LV1	1-407-571-00	VAR 22	Q205	8-724-375-01	2SC403C
LV2	1-407-571-00	VAR 22	Q206	8-724-375-01	2SC403C
LV3	1-407-285-00	VAR 1.5mH	Q207	8-724-375-01	2SC403C
LV4	1-407-565-00	VAR 2.2	Q208	8-724-375-01	2SC403C
			Q209	8-729-384-47	2SA844-D
			Q210	8-724-375-01	2SC403C
			Q211	8-729-384-47	2SA844-D
			Q212	8-724-375-01	2SC403C
			Q213	8-729-384-47	2SA844-D
			Q214	8-724-375-01	2SC403C



# YD-14, FRAME

## E. PARTS

Ref. No. Parts No. Description

Q215 8-724-375-01 2SC403C  
Q301 8-724-375-01 2SC403C  
Q302 8-724-375-01 2SC403C  
Q303 8-724-375-01 2SC403C  
Q304 8-729-384-47 2SA844-D

Q305 8-729-384-47 2SA844-D  
Q307 8-724-375-01 2SC403C  
Q308 8-729-201-04 2SC2878

R14 1-244-837-00 CARBON 33 1/2W 5%  
R62 1-247-228-00 CARBON 330 1/2W 5%  
R63 1-247-228-00 CARBON 330 1/2W 5%  
R247 1-212-712-00 METAL 270K 1/2W 1%  
R310 1-247-217-00 CARBON 110 1/2W 5%

RV1 1-224-250-XX VAR, METAL 2.2K  
RV2 1-224-250-XX VAR, METAL 2.2K  
RV3 1-224-249-XX VAR, METAL 1K  
RV4 1-224-250-XX VAR, METAL 2.2K  
RV5 1-224-251-XX VAR, METAL 4.7K

RV6 1-224-251-XX VAR, METAL 4.7K  
RV7 1-224-252-XX VAR, METAL 10K  
RV8 1-224-251-XX VAR, METAL 4.7K  
RV9 1-224-254-XX VAR, METAL 47K  
RV10 1-224-250-XX VAR, METAL 2.2K

RV11 1-224-250-XX VAR, METAL 2.2K  
RV12 1-224-250-XX VAR, METAL 2.2K  
RV13 1-224-250-XX VAR, METAL 2.2K  
RV14 1-224-254-XX VAR, METAL 47K  
RV15 1-224-250-XX VAR, METAL 2.2K

(S/N. 10001 to 10650 (PAL))  
(S/N. 10001 to 10050 (SECAM))

RV201 1-224-255-XX VAR, METAL 100K  
RV202 1-224-254-XX VAR, METAL 47K  
RV301 1-224-252-XX VAR, METAL 10K  
RV302 1-224-251-XX VAR, METAL 4.7K  
RV303 1-224-250-XX VAR, METAL 2.2K

S1 1-552-509-00 DIP  
S2 1-552-509-00 DIP

TH1 1-800-199-00 S-1250

X1 1-527-976-00 OSC 8.5MHz

Ref. No. Parts No. Description

### FRAME (REF. NO. 200 SERIES)

A-6742-034-A DETECTOR T ASS'Y  
(WITH LE-4B, PH-1B)  
A-6742-036-B DETECTOR S ASS'Y  
(WITH LE-4A, PH-1A)

 1-526-572-00 VOLTAGE SELECTOR

1-555-698-00 WIRE ASS'Y, FLAT 40P (100mm)  
SY-37 TO KY-9

1-555-699-00 WIRE ASS'Y, FLAT 40P (160mm)  
MB-8 TO MB-9

CN201 1-509-891-00 BNC "VIDEO OUT 1"  
CN202 1-509-891-00 BNC "VIDEO OUT 2"  
CN203 1-509-891-00 BNC "RF (OFF TAPE)"  
CN204 1-509-176-00 XLR-3P (M) "AUDIO OUT  
(CH-1/L)"  
CN205 1-509-176-00 XLR-3P (M) "AUDIO OUT  
(CH-2/R)"  
CN206 1-509-176-00 XLR-3P (M) "AUDIO OUT  
(MONITOR)"

CN207 1-509-095-00 8P "MONITOR"  
CN208 1-561-045-00 7P (F) "DUB OUT"  
CN209 1-508-945-00 7P (M) "DUB IN"  
CN210 1-509-471-00 18P (F) "TBC"  
CN211 1-509-891-00 BNC "SC IN"

CN212 1-509-891-00 BNC "VIDEO IN 1"  
CN213 1-509-891-00 BNC "VIDEO IN 2"  
CN214 1-509-891-00 BNC "EXT SYNC IN"  
CN215 1-507-142-XX PIN JACK, 2P "TIME CODE  
IN/OUT"

CN216 1-509-184-00 XLR-3P (F) "AUDIO IN (CH-1/L)"  
CN217 1-509-184-00 XLR-3P (F) "AUDIO IN (CH-2/R)"



Ref. No.	Parts No.	Description
△ CN221	1-509-546-00	3P (M) "AC IN"

CS201 1-586-633-00 CONDENSATION SENSOR

DME201 8-745-203-00 DM203 "CAPSTAN"

H201 8-829-358-35 EPP150-5803B "AUDIO/CTL"  
H202 8-829-371-11 PP171-5802D "TIME CODE R/P"  
H203 8-825-544-10 EF232-58 "FULL ERASE"  
(S/N. Up to 10500: PAL  
S/N. Up to 10050: SECAM)  
H203 8-825-544-20 EF248-58 "FULL ERASE"  
(S/N. 10501 and higher: PAL  
S/N. 10051 and higher: SECAM)  
H204 A-6709-435-A DUR-26-R, UPPER DRUM "VIDEO"

△ M201 1-541-104-00 PE2B55 "FAN"  
(P --- S/N Up to 10600)  
(S --- S/N Up to 10050)

△ M201 1-541-104-51 PE2B55 "FAN"  
(P --- S/N 10601 to 11230)  
(S --- S/N 10051 to 10060)  
M201 1-541-264-11 "FAN", DC  
(P --- S/N 11231 and higher)  
(S --- S/N 10061 and higher)  
M202 8-835-056-01 DNR-1002A "THREADING"  
M203 A-6709-433-A DUH-26A-R, HEAD ASS'Y  
"DRUM"  
M204 8-838-019-01 BHF-1600A "CAPSTAN"  
M205 8-835-050-01 MNR-4400A "T REEL"  
M206 8-835-050-01 MNR-4400A "S REEL"  
M207 8-835-055-01 DNR-4700A "CASSETTE C"

ME201 1-520-438-00 "VIDEO/RF"  
ME202 1-520-439-00 "AUDIO CH-1"  
ME203 1-520-439-00 "AUDIO CH-2"

Ref. No.	Parts No.	Description
PL201	1-518-461-00	14V, 50mA "METER LAMP"
PL202	1-518-461-00	14V, 50mA "METER LAMP"
PL203	1-518-461-00	14V, 50mA "METER LAMP"
PL204	1-518-461-00	14V, 50mA "METER LAMP"
PL205	1-518-461-00	14V, 50mA "METER LAMP"
PL206	1-518-461-00	14V, 50mA "METER LAMP"
PL207	1-518-455-00	12V, 55mA "CASSETTE LAMP"
PL208	1-518-455-00	12V, 55mA "CASSETTE LAMP"
PL209	1-518-455-00	12V, 55mA "CASSETTE LAMP"

Ref. No.	Parts No.	Description
PM201	1-454-279-00	12.4V 11 OHM "S TENSION"
PM202	1-454-278-00	11.3V 21 OHM "SKEW"
PM203	1-454-278-00	11.3V 21 OHM "S BRAKE"
PM204	1-454-278-00	11.3V 21 OHM "T BRAKE"
PM205	1-454-276-00	12V 40 OHM "PINCH"

Ref. No.	Parts No.	Description
RV201	1-226-616-00	VAR, 100K "TRACKING"
RV202	1-224-691-XX	VAR, 10K "VIDEO LEVEL"
RV203	1-228-140-00	VAR, 20K x 2 "AUDIO LEVEL (CH-1)"
RV204	1-228-140-00	VAR, 20K x 2 "AUDIO LEVEL (CH-2)"

△ S201 1-553-159-00 ROCKER "POWER"

△ T201 1-446-938-00 "FAN"  
(S/N. Up to 11230 (PAL)  
S/N. Up to 10060 (SECAM))

TM201 1-548-100-11 "HOURS METER"



Ref. No.	Parts No.	Description
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#### 18-4. PACKING MATERIAL AND ACCESSORY (SUPPLIED)

##### A-6724-244-A EXTENSION BOARD ASS'Y, EX-7

1-561-654-00 CONNECTOR, CARD, 86P

2-251-622-00 LEVER, PC BOARD



##### 1-556-760-XX CORD POWER

3-668-443-00 CUSHION, UPPER

(P --- S/N Up to 10990)

(S --- S/N Up to 10050)

3-688-859-01 CUSHION, UPPER

(P --- S/N 10991 and higher)

(S --- S/N 10051 and higher)

3-668-444-00 SPACER

3-668-446-00 CUSHION, REAR

(P --- S/N Up to 10990)

(S --- S/N Up to 10050)

3-683-616-03 CUSHION (REAR), LOWER

(P --- S/N 10991 and higher)

(S --- S/N 10051 and higher)

3-668-447-00 CUSHION, FRONT

(P --- S/N Up to 10990)

(S --- S/N Up to 10050)

3-683-615-03 CUSHION (FRONT), LOWER

(P --- S/N 10991 and higher)

(S --- S/N 10051 and higher)

3-668-468-00 CARTON, INDIVIDUAL

(P --- S/N Up to 10990)

(S --- S/N Up to 10050)

3-668-468-05 CARTON, INDIVIDUAL

(P --- S/N 10991 and higher)

(S --- S/N 10051 and higher)

3-672-917-00 BOARD PICK

(P --- S/N Up to 10990)

(S --- S/N Up to 10050)

3-688-812-01 SPACER SIDE

(P --- S/N 11281 and higher)

(S --- S/N 10061 and higher)

##### 3-701-649-00 BAG, POLY (FOR BVU-820P/S)

STANDARD PRODUCTS DUBBING CABLE (VDC-5)

1-508-948-00 PLUG, 7P, MALE

1-561-055-00 PLUG, 7P, FEMALE

STANDARD PRODUCTS 9 PIN, REMOTE

CONTROL CABLE (RCC-5G)

1-560-651-00 PLUG, 9P, MALE

1-561-749-00 SHELL